



G  
3

50/C

M. XX  
18/6



LEEDS.









OBSERVATIONS  
ON THE  
MECHANISM OF THE HORSE'S FOOT;  
ITS NATURAL SPRING EXPLAINED,  
AND  
A MODE OF SHOEING RECOMMENDED,  
BY WHICH THE FOOT IS DEFENDED FROM EXTERNAL INJURY,  
WITH THE LEAST IMPEDIMENT TO ITS SPRING.  
ILLUSTRATED BY COPPERPLATES.

---

---

BY  
STRICKLAND FREEMAN, ESQ.

---

---

LONDON:  

---

---

PRINTED BY W. BULMER AND CO.  
FOR THE AUTHOR,  
AND SOLD BY J. EDWARDS, NO. 77, PALL-MALL.  
MDCCXCVI.



ON THE  
MECHANISM OF THE HORSE'S FOOT,  
AND  
THE MODE OF SHOEING.

---

What indeed is to be expected from a man who has no other guide than a long continued practice, and who must of necessity labour under very great uncertainties! Incapable of accounting rationally for what he does, it must be impossible for him to enlighten me, or communicate to me the knowledge which he fancies himself possessed of.

PEMBROKE'S MILITARY EQUITATION.

*Ingenium miserâ quia fortunatius arte*

Credit——

HOR.



## CONTENTS.

---

### CHAPTER I.

	<i>page</i>
SECT. I. <i>The construction of the Foot considered</i>	1
SECT. II. <i>The proper management of it explained, and the sort of shoe which is injurious to it pointed out</i>	20
SECT. III. <i>The disadvantage of turning horses out to grass with their shoes on pointed out</i>	34

### CHAPTER II.

SECT. I. <i>Description of different sorts of feet, and of the proper management of those which are most liable to be foundered</i>	43
SECT. II. <i>The construction of the hind foot con- sidered</i>	70

### CHAPTER III.

<i>Description of the shoe that is best adapted to the foot of a horse, so as to preserve it from external injury with the least impediment to its spring</i>	75
---	----



## PREFACE.

---

THE Observations, which I here venture to lay before the public, were meant to have been dedicated to my late worthy friend and (as he was pleased to call himself) *fellow labourer in the vineyard*, Sir Sidney Medows ; in which vineyard—namely in the Riding-House—we worked together for many years previous to his death. This event has probably deprived me of the same instruction as a writer on the subject of Horses, which he was always kind enough to afford me as a rider ; in the true spirit of that mutual friendship which commenced in my youth, and continued to the day of his death. I have now, therefore, far from the same confidence in appearing before the public, that I should have had with his assistance ; and the present work, before his death, was by no means in sufficient forwardness for me to have had the least communication with him on the subject.

I have, in some respects, the same reason for venturing to give my sentiments to the public in a work of this kind, as the late Earl of Pembroke had some years ago, when he wrote his excellent Treatise on Military Equitation, in which he also gives his remarks on shoeing, and many other particulars best calculated to render a horse serviceable.\* Being equally a lover of horsemanship, I lament, as he did, the want of a more general attention to these circumstances; and, I may add, the want of a greater encouragement to the scientific investigation of these points by those in higher life. A more diffused knowledge of this kind would at least prevent those gentlemen, who are fond of horses, from being out-talked by their grooms; a description of men, who

————— nil rectum, nisi quod placuit sibi, ducunt.

I have frequently heard my late good friend lament this want of a more general knowledge—too evident for him to pass unnoticed—in the various

\* This treatise, the third edition of which was published in 1778, is unfortunately now out of print.

conversations we had with gentlemen, who did us the honour to visit us in the riding-house. The late Earl of Pembroke says, “ whoever lets his farrier, “ groom, or coachman, ever even mention any thing “ more than water-gruel, a clyster, or a little bleed-“ ing, and that too very seldom ; or pretend to talk “ of the nature of the feet, of the seat of lamenesses, “ sicknesses, or their cures, may be certain to find “ himself very shortly, and very absurdly, quite on “ foot. It is incredible what tricking knaves most “ stable-people are, and what daring attempts they “ will make to gain an ascendant over their masters, “ in order to have their own foolish projects com-“ plied with. In shoeing, for example, I have more “ than once known, that for the sake of establishing “ their own ridiculous and pernicious system, when “ their masters have differed from it, they have, on “ purpose, lamed horses, and imputed the fault to “ the shoes, after having in vain tried, by every sort “ of invention and lies, to discredit the use of them.”

In the present work, I chiefly confine myself to

pointing out how essentially necessary the proper method of shoeing is to the spring of a horse; which it has long been my greatest entertainment to put into motion, as well as I am able, from the instructions I have been fortunate enough to receive. To shew of what consequence an attention to these points is to our cavalry in general, I cannot do better than refer those of my readers, who are still in possession of it, to the publication of the noble author abovementioned. This I wish to do on more accounts than merely for the subject on which I am here presuming to write.

An accident, which I met with a few years ago, that had nearly deprived me of my life, brought me to the acquaintance of the late Mr. John Hunter, and to that of his brother-in-law and successor Mr. Home. To them I am indebted for my recovery, and to the latter for correcting the description of the anatomical parts of this work; and for permitting me to have the use of a person, at that time employed by him, to assist me in dissecting those parts of a horse's foot,

which I found absolutely necessary to do with my own hands in order to convey my own ideas. A draughtsman \* at those times attended me, who could represent with accuracy anything that was set before him. By these means I insensibly found myself in possession of a more regular, and larger series of drawings of the anatomical parts of a horse's foot, than I had yet met with ; on which account I was induced to have them executed on copper plates. Should these meet the public approbation, it will be a greater encomium than any I can possibly pass on the abilities and indefatigable industry of Mr. Skelton the engraver.

I was led to these researches on the anatomical construction of the foot, from having, by constant attention for some years past, carefully observed the various exertions of which the limbs of a horse are capable ; and from having noticed, in consequence of frequent conversations with my late much-regretted master in horsemanship, the necessity there is

\* Mr. Kirtland.

for preserving the elasticity of the heels for those purposes. I had at the same time reason to observe, how ill the defence, commonly adapted to prevent the hoof from wearing away, consisted with the preservation of that elasticity. Though I took up this study at first merely for my own entertainment, the progress of it led me into so wide a field, that in the course of it I presumed to think it might be of service, if laid before the public.

If that should prove to be the case, I shall hold in my remembrance a still stronger idea of the obligations I have always thought due to the person to whom these Observations were meant to have been dedicated, for his kind instruction in an art, which will probably continue to be a source of entertainment to me for the rest of my life.

*Fawley Court,*  
*Feb. 10th, 1796.*

# OBSERVATIONS

ON THE

## MECHANISM OF A HORSE'S FOOT, &c.

---

---

### CHAPTER I.

#### SECTION I.

##### THE CONSTRUCTION OF THE FOOT CONSIDERED.

I SHALL begin these Observations by giving some general idea of the construction of the hoof, and of the motion which its elasticity admits. This ought always, as much as possible, to be preserved, in order to co-operate with the motion of the muscles, from which the spring in all animals is derived.

This will naturally lead me—first to explain the position of the bones for the purpose of sustaining the weight, and their motion on one another. Their ligaments, and the cartilages peculiar to the foot bone, will next be described; and afterwards the

motions produced in the different parts of the foot, while the horse is in action.

“ *Ordinis hæc virtus erit, et venus aut ego fallor!* ”

The hoof of a horse is in its nature similar to the nails of the human body, each proceeding from the *cutis*, or true skin. Where the true skin begins to produce it, the hoof is extremely soft, thin and white, becoming harder and thicker towards the extremities. The outward part, which is the hardest, is called the crust, or wall ; the front is the toe, the sides are the quarters. This part, though solid, is of a fibrous texture. The fibres are closely united, and their direction lies from the upper part, which is called the coronet, downwards. They may be easily detached by maceration, but will frequently shew themselves without any artificial aid—in very strong crusted hoofs—by cracks ; which, from harbouring sand, are usually called *sand-cracks*. In the interior part of the hoof these fibres become a laminated substance, following the same direction,

and placed, as I shall hereafter describe, in such a manner as to be peculiarly subservient to the elasticity of the hoof.

The nail of the human body is made as the hoof is—soft, and white at the root; and harder and thicker as it proceeds further. It is hardest in the middle, and softer and thinner on the sides; in consequence of which, any exertion may be best carried on, by a given elasticity, quite to the middle of the nail. The hoof of the fore foot of a horse is of the same construction, which produces an elasticity, continued from the quarters to the point of the toe. That point is the fulcrum of the spring when most violently exerted, as when a horse is galloping in full speed, or when drawing the greatest weight. The toe of the fore foot is naturally, therefore, the hardest part; that it may be best enabled to resist the violent concussions to which it is continually subject, from encountering hard and uneven substances. The sides of the wall are thinner towards the heels, to give room for the free

motion of the flexor tendon, when that part of it which unites itself to the foot bone is forced downwards by the violent pressure of the toe against the ground; at which time the flexor tendon of the foot bone is pressed down by the coronary bone and nut bone. The nut bone\* is interposed between the flexor tendon and the other bones, to remove the insertion of the tendon further from the centre of motion, having a polished surface both towards the bones and towards the tendon.

When the hoof is in such a state as not to impede the action of the tendon upon the bones, it is the easy play of these parts which produces that spring to the foot so necessary to the exertions of the horse, and to the entertainment of the rider, when the horse is required

“Aut molles glomerare gradus, aut flectere gyros.”

The coronary bone,† which rests partly on the

\* See Plate I.

† This bone is probably so called on account of the insertion of the extensor tendon, the attachment of the ligaments, and of the cartilages

nut bone, and partly on the foot bone,\* is connected to the foot bone by two ligaments ; these ligaments enter a hole in the foot bone, made for their reception, close to the insertion of the extensor tendon.†

The nut bone is connected to the foot and coronary bone by three ligaments ; one of these ligaments takes its rise from the whole length of the rough groove on the lower and back part of the nut bone ;‡ and is fixed to an angular eminence of the foot bone, immediately above the insertion of the flexor tendon into the last mentioned bone.§

This eminence prevents the projecting edge of the foot bone (all which are united to one another, and come just within the hoof) forming a kind of circle, or crown.

The hoof, or cuticle, which the true skin begins to produce immediately over these parts, is excavated here on purpose to receive them, bearing the shape of a hollow ring. I have before remarked, that the hoof, at its commencement, is extremely soft, thin, and white ; and being hollowed out in this part, there is less pressure here than the foot bone afterwards receives from the hoof by the latter becoming harder and thicker towards the extremities.

\* See Plate II. fig. 2.

† See Plate III.

‡ See Plate IV. fig. 2. and Plate V.

§ See Plate IV. fig. 1. and Plate V.

the foot bone from bearing on the ligament, even when the horse is in his utmost exertion, and the cavity is filled up by a portion of fat, adhering to the upper surface of the ligament.\*

The two upper ligaments arise from one common origin attached to the whole length of the rough upper surface of the nut bone,† and pass on each side of the joint along lateral depressions in the coronary bone; and having arrived at its fore part, are continued on to the pastern bone, to which they are attached just above its articulation with the coronary bone. Through their whole course they adhere firmly to the different bones. Where this ligament is united to the nut bone, it is thick and strong; but the upper part and lateral bands send off a very thin ligamentous expansion, covering the fat which lies on the posterior part of the coronary bone, and on the upper projecting surface of the nut bone:‡ so that, as the motion of the nut bone

\* See Plate I.

† See Plates II. IV. V. and VI.

‡ See Plate II. and Plate I.

is required to be greater than that of any other bone, and of a different kind, it has a portion of fat connected both to the upper and lower surfaces of it, which admits of a more easy play of the parts on one another. In great exertions the coronary bone is pressed suddenly and violently on the nut bone; and the lower projecting part of the nut bone presses and slides on the foot bone, at the same time that the posterior surface of it slides on the flexor tendon.\*

Having finished my description of the bones and their ligaments, the cartilages peculiar to the foot bone come next under consideration.† These are two, one on each side: they are connected to the body of the bone by a firm union, being fixed in a broad groove of some depth, close to the edge of its articulating surface with the coronary bone; and adhere laterally to the ligaments of the joint.‡ These cartilages are continued upwards as high as

\* See Plate I.

+ See Plate VII.

‡ See Plate III.

the upper end of the coronary bone, becoming gradually thinner, till they are insensibly lost; and are every where surrounded, and perforated, by a number of blood vessels. The under surface of the foot bone of a horse is hollowed to give it a hold on the ground, and to prevent it from slipping upon it: its processes give attachment to the cartilages, which are continued to the heels, and terminate in a thin edge, which is bent inwards and forwards.\* The upper and posterior part of this edge is united by strong ligamentous fibres to the under surface of the foot bone.† The interstices of these fibres being filled with fat, where they join the cartilages, form a mass of considerable thickness, and serve as a cushion for the flexor tendon, which they immediately cover; and in this part take the name of the fleshy frog.‡ The sheath of the flexor tendon becomes extremely thin where it meets with this ligamentous substance, to which it firmly adheres;

\* See Plate VII. fig. 2. and 1.

† See Plate VII. fig. 3.

‡ See Plate I.

and the interstices, being filled up with fat, defend the tendon from external violence. For when a horse is in full gallop, without any shoes at all, or only with plate shoes on, the nut bone presses the flexor tendon down with great violence ; and the fleshy frog with its covering is made to strike against the ground.

I have before observed that the cartilages of the foot bone are continued by a thin edge to the upper articulating edges of the coronary bone, and are entirely surrounded by blood vessels. I shall proceed next to the arteries and veins.

One large artery, accompanied by one large vein, passes along the posterior concave surface of the cannon bone, covered by the flexor tendon, till they reach the lower projecting surface of that bone. There they each divide into two, and proceed on each side of the flexor tendon, throwing out various ramifications, till they come to the cartilages.\* The main trunk on each side, at this part sends off two

\* See Plate VIII.

principal branches, one of which goes round the coronet, and anastomoses with a similar branch from the artery on the opposite side.\* The other runs along the cartilage to the fleshy frog, sending off a number of branches in its course.† The trunk itself is continued down into the hollow of the foot, and when it arrives at the processes of the foot bone, sends off one large branch, which passing through the cartilages between these processes, runs transversely in a groove along the anterior surface of the bone,‡ and is lost upon the soft parts which cover it, putting out several branches which enter into the substance of the bone. This artery, as soon as it has passed the processes, sends off one branch, which passes downwards to the inferior edge of the foot bone, and runs along that edge, producing branches in every direction. The main trunk on each side passes along a groove, and through a hole into the substance of the foot

\* This is what is commonly called the coronary artery, see Plate IX.

† See Plate VIII.

‡ See Plate III. and Plate VII. fig. 2.

bone.\* In its passage through this bone it divides into several branches, which pass out through corresponding openings on the anterior surface of the foot bone, and anastomose with those from the opposite side, and with the lateral branches.

The veins upon the foot are in infinitely greater number than the arteries. Smaller ramifications, anastomosing universally with one another, form a kind of net-work over the whole of the under and anterior surface of the foot bone, below the coronary ring. The branches, which cover the cartilages and the coronet, are very numerous; but become much larger, and form common trunks of a considerable size, which unite over the anterior surface of the extensor tendon, and likewise again a little higher up, under that tendon. These form one large venous trunk on each side of the flexor tendon. This appearance of the veins will be better seen in the plates than can be illustrated by words.

\* See Plate IV. fig. 1.

The skin surrounds the whole foot like a glove.\* That part of it which corresponds with the toe, the quarters, and bars of the hoof, is of a laminated texture. These laminæ are extremely vascular, and terminate in a fine villous surface, which forms the organ of touch. The other parts nearly resemble the common skin of the body. These tender parts are preserved from injury by a strong cuticular covering, called hoof, generated by the skin. For “cuticle, hair, nail, and hoof, are equally productions of animal substance;” as Mr. Home justly observes, in a very ingenious paper, published in the Philosophical Transactions, entitled “Observations on certain horny excrescences of the Human Body.”†

The hoof, which was the part I touched upon in the beginning of this chapter, comes the last under consideration, as being the outward covering of all.

\* See Plates X. XI. XII. XIII.

† See Phil. Trans. Vol. LXXXI. p. 95.

The walls, from the coronet downwards, diminish in height as they come to the heels: at this place they are folded back as a covering to the lower posterior extremities of the cartilages of the foot bone,\* and terminate nearly in a point when they have formed a complete covering.† These returns inwards and forwards, take the name of the bars or binders. They enclose these extremities of the cartilages in the same way as the quarters cover the heels, and equally admit of expansion and contraction; so that when a horse is in full gallop, there is a repeated alternation of these opposite actions. For when his feet strike the ground, the elasticity of the bars aids the pressure of the bones in the expansion of the heels; which are again immediately contracted by the quarters, the moment his heels are again in the air.

Hence the infinite consequence of what I shall soon have occasion to mention more particularly, namely, the due degree of moisture in which the

\* See Plate VII. fig. 2.

† See Plate XVI. fig. 2.

foot ought to be kept, the proper length of the shoe, and the manner in which it ought to be put on, so as to promote the two circumstances of expansion and contraction, which of all others are the most important. Unless these are duly preserved, numerous evils will follow, which I shall hereafter endeavour to explain.

As the extremities of the fingers of the human hand are the organs of touch, the skin which covers them is extremely sensible, and is only covered by a very thin cuticle: but the foot of a horse—being adapted to bear his weight and exertions, as well as to have the necessary feelings—requires to be more guarded, that its sensibility may not be injured. It has therefore a cuticular covering of a denser nature, being that part of the hoof called the sole.

The sole is firmly attached to the skin which covers the under surface of the foot bone. It is connected to the walls at the extreme edges of the bone, where the skin is the most sensible, and is

of a looser texture than the rest of the hoof. It scales off and renews itself perpetually, by which it is easily enabled to recover the accidents to which it is liable.

The coronet (which, as I have before explained, is the softest part of the hoof) returns from the heels inwards and forwards, like a dart ; and extending itself over the skin of the fleshy sole, constitutes its last outward covering, and in this part takes the name of the frog.

It is enabled to yield to the expansion of the foot by having a longitudinal cleft or opening in the middle, which expands and contracts itself upon violent exertions, when it is permitted to touch the ground. It also yields to the binders in the expansion of the heels, and to the bones in their play upon one another. Though the frog is thicker than the parts from which it proceeds, it is less compact in its texture. Exterior moisture, though absolutely necessary, does not penetrate into it in the least ; nor does it, as it is sometimes imagined,

receive any oil strained off from the fatty cushion, which is placed between the flexor tendon and the upper surface of it. To ascertain the truth of these assertions, I made the following experiment.

A farrier, under my direction, cut the frog of a cart horse pretty close. The outward slices were moist of course, but the slices next to these had no moisture at all. Several of these were put into an earthen pipkin with clean water, and boiled over the fire; pieces of blotting paper were then laid upon the surface and readily imbibed the fluid. These were dried, and afterwards burnt in a candle, but they exhibited no appearance whatsoever of oil. Hence it is evident that the upper part, next to the fleshy frog, contains only the moisture common to all parts of the body. But if the natural expansion of this part be diminished by its being taken from the ground by the shoe, moisture is absolutely necessary to be applied to its external surface. For when it receives no aid either from moisture or

friction, it shrinks and wastes away ; the bars in this case lose their power of contracting the quarters, which last consequently become over contracted. When the frog is in this state there is no moisture but what is confined in the longitudinal cleft in the middle, and in the clefts which divide the frog from the sole. When this moisture remains confined there for any length of time, it constitutes a disease called a thrush, of which more hereafter.

In order that the hoof may take its share in supporting the weight, and in bearing the exertions of the horse, the toe of the fore foot, as I before observed, is the thickest and the hardest part of the whole wall. The fibres of which it is composed, which internally become a laminated substance,\* are consequently more numerous ; their position is also in this part the nearest to a perpendicular. This gives it the greatest power of bearing the shock, to which the toes of the fore feet are the most subject when a horse is exerting himself to the utmost, either in

\* See Plate XIV.

galloping or in drawing. As this laminated substance continues from the toe to each quarter, it is turned more and more aslant, by which it obtains a still greater power of yielding to the shock: the quarters being also made thinner, have more power of expanding themselves by a given impulse from the bones.

If the foot be not shod when it strikes the ground, the toe is liable to snap by the position of the laminæ being upright and edgeways: but the laminæ of the quarters being more inclined, and striking laterally, yield to the blow without being injured. The laminated substance at the heels on their return to the bars, although their position is the most horizontal, lies edgeways, and consequently equally adapted to bear pressure on their edge, as well as lateral expansion. From this to the extremity of the bars, the position, though nearly horizontal, is still sideways, and consequently equally adapted to bear pressure and expansion, which are at the same time required of the bars, whenever the heels give a blow on the ground.

Nature having therefore given the guards I have mentioned, any artificial covering, further than to that part which is liable to break upon a blow being given, is certainly not only unnecessary, but extremely injurious, tending only to put the spring out of order by taking away friction and moisture, two things which are so extremely essential to it.

## SECTION II.

THE PROPER MANAGEMENT OF THE FOOT EXPLAINED, AND THE  
SORT OF SHOE WHICH IS INJURIOUS TO IT POINTED OUT.

RACE horses have only a short shoe with the narrowest web possible; and it is likewise a general practice never to try a horse without plate shoes on; since it is found that no exact trial can be made with the shoes he commonly wears at his exercise. Whether the difference of the spring which is gained by the heel having its full power of expansion, or whether more probably only the variation there may be in the weight of a common shoe, or of a plate shoe, be the cause which is in general considered, I will not pretend to determine; but where so great a nicety is required as in the trial of two race horses, every thing which may in the least contribute to the full exertion of their limbs must be of consequence. This is most likely to be attained by the heel being best able to exert its natural elasticity from

having the least pressure possible upon those parts of it, which—I have just shewn—nature has sufficiently guarded already; and which are so intimately connected with the spring of the horse.

Fortunate would it be for race horses, who when most wanted to be exerted—namely in summer time—have generally the hardest ground to tread upon, if they were never allowed to wear any other than a stronger sort of plate shoe, made rather longer than the shoe they have to run in. This should be kept as wide at the heel as the narrowness of the web would admit, in order to prevent its getting into the foot. The shoe I should recommend is that of which I have given a plate for a manage horse.\* This is all the covering a race horse requires: for I have already shown that nature has so perfectly guarded the inner parts of the foot from external injury, that nothing more is wanted than to prevent the outward wall from wearing away, or breaking off by violent friction or exertion. The great benefit which

\* See Plate XVI. fig. 4 and 5.

would be derived from this, besides the expansion being less impeded, is—that the heel would constantly partake of the small degree of moisture which there is at that time in the ground, by being constantly allowed to touch it. The flexor tendon would also be infinitely more at ease by being allowed to take a greater bearing upon its natural cushion the frog. When stopping is required, the sort I should recommend, and which I always use, is clay with a mixture of cow-dung and chamber-lee just sufficient to make it of a proper consistency. It is thought very commonly that it is enough to wash the feet; but even permitting the frog to touch the ground as much as I do, I have found it not sufficient; especially for horses which have very strong hoofs. In this case, the wall should be kept moistened at the heels, as well as the sole stopped in the manner I have recommended. If the heels are naturally so strong that the moisture cannot have sufficient effect, a rasp may now and then be used in the manner I shall soon have occasion to describe.

Where a great nicety is required about the appearance of the outward crust in front, and where it is apt to be brittle, oil may perhaps be allowed, to moisten the dry brittle part in front; but on the hinder parts, which are naturally more porous and soft, oil will have a contrary effect; it will close those pores, and render that part drier and less flexible than it was.

When friction is denied to the foot by its being shod, moisture is more particularly necessary, to prevent an over compression of the innumerable blood vessels enclosed between the hoof and the foot bone, the circulation of which would be promoted by friction; which shews the necessity there is for covering the foot as little as possible.

Although artificial friction cannot be given to a horse's feet, this is not the case in regard to his legs. The utmost friction should be given to the legs after they have been washed with cold water; as it promotes that circulation in the blood vessels, without which the legs would soon become cold and stiff,

whatever moisture might be applied to the feet ; and obstructions would be occasioned in the vessels by the coldness of the water after exercise, that would be of infinite detriment to the horse.

Grooms to obviate this, and to save themselves the trouble of rubbing the legs, too frequently wash them with warm water, and think they thus bestow upon them the warmth required. But warm water only relaxes the sinews, which have frequently been too much strained already by over exertion ; and afterwards produces that very coldness in the legs and feet which it was intended to prevent.

No water—be it ever so cold—can be injurious to a horse's legs—after the strongest exercise, provided—as I before observed—that a violent friction immediately ensues : on the contrary, if this be done, the cold water is of the greatest service ; but, without this care, it is injurious for the reasons I have given.

As a race horse is so much benefited by the unrestrained power he has of exerting his feet, when only shod with half shoes ; so is a manage horse

equally benefited by the sort of shoe most resembling that of the race horse.\* For the entertainment of the rider in the manage consists chiefly in putting into action all the powers a horse possesses, in order to render his limbs as supple as possible; and those feet have certainly the greatest elasticity which have the greatest powers of expansion and contraction. For this reason I have found the sort of shoe, of which I have given a drawing, highly beneficial. Nor do I find their feet at all the worse when they travel in this shoe upon the road: whence I conclude that a race horse, who has only to go gently along the road from race to race, would suffer no more from it than a manage horse: so that if he were to wear shoes of this sort at his exercise, there would be no occasion for changing them when he was required to go a journey.

All horses, therefore, kept for entertainment in the riding-house, should have a shoe of this kind on their fore feet; but from the different construction

\* See Plate XVI. fig. 4 and 5.

of the hind foot, which I shall soon have occasion to explain, none are required for them behind. These horses should likewise stand on the pavement in the stall for a considerable time during the course of the day, to harden their feet, so as to enable them to bear the greatest exertions without feeling any injury. Indeed so much was the hardening of the feet attended to before shoes were invented, that stone pavements used to be recommended for them to stand upon, as Mr. Clarke observes in the introduction to his *Observations on the shoeing of Horses*.\* He likewise says, that there is a sufficient proof in the north and west parts of Scotland, and in Wales, how little covering is necessary to a horse's feet, by their being able to undergo very hard labour in the mountainous parts of these countries without any shoes at all. For their feet, " from being " accustomed to go bare, and rubbing frequently " against hard bodies, acquire (like the hands of a

\* This book written by Mr. John Clarke, farrier to his Majesty for Scotland, was published in the year 1782.

“ labouring man) a callousness and obduracy which “ adds greatly to their firmness:” whereas, if a London coachman has not his horses shod with a long shoe, made with a broad web to it, in order to guard their feet from being hurt by the pavement, he thinks it impossible for them to go sound for the length of a street.

This I know to be generally the case, having had the utmost difficulty in persuading to a contrary practice those with whom I have been concerned. I must beg leave to mention, as the strongest proof of the truth of Mr. Clarke’s observation, that I drove, for five or six years, a large coach horse with a very broad foot, with a sole almost convex, and low and weak heels, and I always shod him with the same shoes as the others;\* so that his frog, except when he was just fresh shod, constantly touched the ground. This horse went sound over the stones

\* This horse was shod for me, when in town, by W. Moore in little Clarges-street, who has constantly worked for me and for the late Sir Sidney Medows.

in London, and on gravelly, sandy, and rocky roads in most parts of England to the day of his death ; excepting, perhaps, every now and then, when his shoes were left on too long, so as to press into his feet. At those times, if on a journey, he was apt to suffer ; but this was immediately remedied by fresh shoeing.

Mr. Clarke, to whose judicious observations and remarks I shall beg leave to refer my readers, makes mention of a similar case, within his own knowledge.\*

When, according to the general method, a long shoe with a broad web is unfortunately put on, which is made thicker at the heels than at the toe ; the consequence, which commonly ensues, is that of hindering the expansion of the heel of the foot ; which, in that case, soon over-contracts itself. This circumstance produces very great pain to the foot by occasioning too great a compression of the cartilages, and of the blood vessels by which they are sur-

\* See Clarke, page 74 to 77.

rounded. To ease these blood vessels, I have known scores made perpendicularly, all the way down every part of the outward wall, with a drawing knife; and blood taken by a lancet underneath. This is but a partial remedy, and frequently a bad one. For although a temporary ease may be given to the foot by a process, which possibly does diminish the power of contraction in the heels as long as the crust is weakened by the scores on the wall; yet as the wall is perpetually renewing itself, the heel has in a short time a power of becoming still stronger and more contracted, after the temporary weakness has ceased which was occasioned by the scores. But the worst of all, though too often practised in this case, is cutting away the bars; which, for reasons I have given before, serves only to increase the contraction it was meant to prevent. This is but the beginning of the injury occasioned by a long thick shoe. For by keeping the frog from the ground—and consequently from a necessary degree of moisture—as the walls draw in, so the frog contracts,

and wastes itself. The flexor tendon is consequently deprived of its natural cushion by the heel's being taken from the ground. In this case the heels of the hoof overpress the cartilages which are attached to the processes of the foot bone. For the heels are restrained from a possibility of expansion, being bound by the shoe, which by its length and thickness tends likewise to deprive them of the moisture they would otherwise receive.

These processes, thus constrained, impede the action of the nut bone upon the flexor tendon. In this case, instead of the coronary bone moving partly on the foot bone and partly on the nut bone,\* the centre of gravity is thrown entirely on the foot bone by the constraint of its processes. Consequently the position of the coronary bone, and most frequently of the pastern bone, which presses upon that, becomes one straight perpendicular line ; and all the spring of the foot, which depends on the free motion of the nut bone upon the flexor tendon,

\* See Plate I.

is entirely lost. For the cartilaginous processes of the foot bone, being thus constrained by the quarters, have the same effect upon the horse as high heeled shoes have upon a woman.\*

This perpendicular pressure frequently lasts but for a short time. For the pain occasioned by it causes the sinews of the leg to swell above the coronet. Recourse is then generally had to blistering and firing. The contraction occasioned by this remedy only tends to hasten what would otherwise naturally happen: for though the action of the flexor tendon is impeded by this, the extensor tendon—still having its full powers—begins to receive the pressure of the bones. At this period the horse begins, as the grooms term it "*to get over at the knee,*" his weight being thrown

\* The inflammation occasioned by this is sometimes so great as to occasion an ossification of all the surrounding parts of the bones of the foot. Mr. Moorcroft, to whose acquaintance the late Earl of Pembroke introduced me long before his abilities acquired him the reputation he so justly deserves, will I hope some time or other publish an account of the diseases of the feet, wherein this circumstance will be more fully illustrated.

forward from his haunches to his shoulders, from want of play in the nut bone and flexor tendon, and from the extreme pain he suffers in putting his fore feet to the ground. This has a tendency also to throw his rider forwards, which additional weight contributes very much to increase his complaint. Indeed this circumstance so frequently happens, that I heard a foreigner remark, that Englishmen and their horses always go upon their shoulders.

Whoever observes the trembling of a post-horse's legs in this state, when first led out of the stable, will have too good an illustration of the observations I have made. When perspiration begins to come on in the course of his journey, the parts have in a small degree the power of recovering their tone. But a leg in this state is absolutely incurable by any means whatsoever; and it is generally suffered to go with a bar-shoe on the foot as long as it can; since, after some time, the heel has so thoroughly taken the shape of the bar-shoe, that it is incapable of bearing any other. I have seen instances of post-

horses' feet being so much injured by the confinement of bar-shoes, that the frog (the construction of which I before explained) has exuded a foetid matter from its cleft, so acrid as to corrode the upper part of the extremities of the heel, when it was too much pressed by the bar-shoe for the matter to be able to vent itself below. I have seen others—probably from the consequence of corns by bad shoeing—which had part of the outward crust and the lower cartilaginous processes of the foot bone cut away, and bar-shoes put on to protect them, when in that state, from external injury.

## SECTION III.

THE DISADVANTAGE OF TURNING HORSES OUT TO GRASS WITH  
THEIR SHOES ON POINTED OUT.

HORSES are frequently turned out to grass with their shoes on, in order—as it is said—to preserve the shape of their feet, and to prevent the outward wall from breaking off if the ground happens to be rough, and the crust thin and brittle; in which case the smith might have greater difficulty in shoeing them, and their shoes might not stay on.

When a horse of this sort is turned out for any length of time with his shoes on, and taken up again to be shod for service, the smith—in order to guard so thin and brittle a hoof, and that he may not suffer the disgrace, as it is generally termed, of a shoe's falling off—puts on a long shoe with a broad web to it, made very strong, lest his foot should receive an injury by any part of it touching the ground.

That the greater purchase may be taken by the nails into the outward wall, the shoe is made concave. This form—added to the breadth of the web—makes it appear the same when he sets his foot to the ground as half a walnut shell would be, the middle, and narrow end of which had been purposely cut away, and the outward part of the remainder laid on a flat surface.

This is about as flat as a thin footed horse, loaded as I have described, can set his foot on a pavement. Through this shoe are driven a great many nails, made so thin that it is almost impossible every one of them can go exactly where it was intended; and put so close together in the part where the smith finds he can take the greatest purchase; that if the shoe does come off, which by its own length and weight frequently happens, every particle of the outward wall—of which it was possible for any hold to be taken—must come away with it.

This, though at the time thought to be the greatest misfortune, is generally the luckiest thing that could

happen ; for it obliges you to turn out the horse for a considerable time without his shoes, which is sure to set the whole matter right again, if the accident has not occurred too frequently. This I shall soon have occasion to illustrate by an instance of a horse which I turned out nearly in that state. If unfortunately such a shoe does stay on, it is chiefly from the hold which some of the nails may have taken at the heels, where the greatest number is in this case generally put, the outward wall being in that part naturally in too moist a state to break off. But the wall, as I have before shown, is thin in those parts ; and consequently the delicate parts of sensation about the lower extremities of the cartilages of the foot bone, more liable to be injured by the slightest pressure of the nail. Besides that, the least constraint of the processes is, for the reasons I have before assigned, extremely injurious to the spring of the foot: the nails therefore, if it were only on that account, should never be suffered to be driven near the heel. The reason, why nails are too often put

very far back in the heels, is that smiths, instead of making their shoes flat, too frequently make them so as for them *to take purchase* on the walls of a good footed horse ; for which, in that case, there cannot be even a pretence. I have seen one instance of such an effect produced by this practice on a very old cart horse which formerly belonged to me ; that, for a few years before his death, the sole became so convex, that no part of the shoe could touch the ground except the inward edges of the broad concave web.

I had a very strong proof of the advantage gained by turning a horse out to grass without his shoes in one which I bought of a dealer, whose hoofs were extremely thin and brittle. Contrary to the representations of every one, who said I should ruin the horse, I pulled off all his shoes, and turned him out to grass for six months upon ground which happened to be rather hard than otherwise ; giving him just space enough to allow him a fair gallop. The walls of his hoofs, when I turned him out, were so much broken, that there had been great

difficulty in shoeing him ; and after he had been out about a month the remainder broke off; so that any one would have said at that time, that his feet were totally spoiled. But I had reason to believe that the separation of this outward broken shell had nothing to do with what was growing up ; and that as there were neither shoes, nor half shoes, nor any impediment whatsoever to the growth of the hoof, (which, like the nails of a man, is by nature perpetually renewing itself) it would grow again as good as when he was a colt ; and so it turned out ;—for his feet became tough and hard as they renewed themselves. When I took him up I put on the lightest shoes that could be made (taking care that they were not so slight as for the iron to bend) and with such shoes, made in the manner I shall hereafter describe,\* this horse has gone perfectly sound ever since, and I have now had him six years. I think I cannot give a stronger instance of the folly of keeping a shoe (and that shoe frequently a heavy one) upon a horse with a thin

\* See Plate XVI. fig. 1 and 2.

brittle hoof, when turned out to grass for any length of time, under the notion that the crust will otherwise break off so much that he cannot again be shod.

When horses are turned out to grass for any length of time with their shoes on, it exactly counteracts the benefit that is meant to be gained; which is, that the hoof may be renewed in the best manner and in the shortest time. Nor does the injury rest here; for the shoes of those horses which are turned out to grass are seldom looked at and removed, as they would be if they stood in the stable: neither are they in general kept wide enough at the heels to prevent the outward crust from growing over them at that part, if neglected. In this case the pressure of the shoe, when driven in by the growth of the walls, counteracts the power which the sole has of renewing itself. It also prevents it from acquiring that firmness, without which it cannot resist any outward injury, and consequently is said to continue to require the covering of a broad webbed shoe.

The bars also, being pressed by the shoe underneath, must likewise be pressed by the weight of the horse above them. Now as the lower parts of the cartilaginous processes of the foot bone are surrounded with blood vessels, covered by those returns of the heels called the bars ; the heels of the shoe—coming within the heels of the foot—rest absolutely upon the bars, and upon the extremities of the sole, by the quarters growing over the outward edges of the shoe. This circumstance prevents the growth of the bars, without which, as I before observed, the foot cannot expand itself, as there is in that case nothing which can counteract the pressure of the quarters. It occasions also a compression of the blood vessels surrounding the lower extremities of the cartilaginous processes of the foot bone, which last are covered by the extremities of the sole, and by the bars. From this circumstance arise what are generally called corns. These are in general worse on the inside of the foot than on the outside ; as the inside quarters are the weakest, and the pressure on

them most commonly the greatest. These corns can never be cured, till exactly the contrary method is taken to that by which they were produced, which I shall have occasion to mention in the following chapter.



## CHAPTER II.

### SECTION I.

#### DESCRIPTION OF DIFFERENT SORTS OF FEET, AND OF THE PROPER MANAGEMENT OF THOSE WHICH ARE MOST LIABLE TO BE FOUNDERED.

COLTS which have the sides of the walls of the hoof neither too high nor too low, and moderately drawn in by nature, prove in general to have the best feet, as the heels are in that case contracted like a bent spring not in use, which gives them the greater elasticity when any extraordinary exertion is required. But it sometimes happens that the walls of the fore feet of a colt are so strong, that the heels do not expand themselves ; and, as soon as they are shod, the contraction increases by the decrease of moisture, and by being allowed less friction against the ground. This kind of foot, owing principally to the want of friction, is subject to the same complaints that

affect a good footed horse, when injured by a long broad webbed shoe, which I have before explained.\*

It is a general observation that English horses are more subject to suffer by over strong feet, and by narrow and contracted heels, whether natural or made so by bad shoeing, than those of any other country. Upon this account it is more particularly necessary for an English farrier to do his utmost to prevent it. The only ways in which it strikes me to account for this circumstance, are—first, that English horses are more generally than those of any other country (Arabia perhaps excepted), lower before than behind —especially our race horses ;+—by which, when in action, the centre of gravity is thrown forward. In order also that a jockey may ride as firmly as possible on a race horse, with his stirrups short enough for him to bear upon them instead of upon his saddle, his

\* Pages 28, 29, 30.

+ This may be partly the reason of their excelling in speed. For a hare and a greyhound are likewise made in this way; which two animals can gain more ground in their stroke than any others in proportion to their size.

body is obliged to be inclined forwards sufficiently to keep him steady. In addition therefore to what I have said of the make of English horses in general, this custom, which is adopted by all English jockies, by sportsmen, and indeed I may say by all Englishmen when they ride at full speed, has a tendency to throw more weight on a horse's shoulders. If any other reason can be assigned, it is perhaps the nature of our climate. For except for these reasons, horses bred in hot countries, and shod with long shoes, or with shoes which almost cover their feet, would be still more subject to be foundered.

Now it is well known that the Turks cover their horses feet almost entirely with iron, there being only a small round hole left in the middle of the shoe; and that Spanish horses have chiefly long shoes with broad webs. The feet of these horses, being thus constantly taken from the ground, and having generally deep crusted hoofs, narrow heels, and small frogs, would be more subject to be foundered than ours are, which, when bred upon very

dry grounds, are apt to have the same defects. But these horses, especially the Spanish, have their shoulders naturally more supple than ours, are naturally more set upon the haunches, and carry their riders more evenly poized. The centre of gravity is consequently exactly the reverse of that which is common with our horses ; for theirs, when in action, is chiefly upon their haunches, which is not often the case with ours.

Horses naturally made with more supple shoulders, and by nature more set upon their haunches, can keep the pastern bone and the coronary bone in a more sloping position, by having less weight for their fore legs to support, and consequently higher fore action. By the sloping position of the pastern bone there is a greater pressure of the coronary bone upon the nut bone, and of the nut bone on the flexor tendon ;\* although that tendon, where it joins the foot bone, may possibly be confined by strong narrow quarters. English horses, on the con-

\* See explanation of the action of these bones, page 4.

trary, when bred in high grounds, have generally more upright pasterns than others ; and having more weight on their fore legs, when made lower before than behind, the coronary bone presses more upon the foot bone than it does upon the nut bone. There is consequently a greater jar from the weight falling more on the bones of the foot between the flexor and extensor tendons than on the flexor tendon. Indeed, as I before mentioned, this weight instead of coming partly on the flexor tendon as it ought to do, sometimes falls on the extensor tendon. This happens when a horse begins to be foundered by the inflammation occasioned by the constant perpendicular pressure of these bones on one another, and by receiving little or no relief from the action of the flexor tendon.\* I have formerly had several young horses with upright pasterns and strong feet absolutely crippled from this single cause very soon after they have been set to work ; when their feet, by being shod, were deprived of the benefit they

\* See page 4.

would have received by moisture and friction upon the ground, which was the only chance they could have of expanding themselves.

During the progress of this work, I happened to meet with a treatise upon shoeing, written in the year 1766, by Mr. W. Osmer. Though a singular composition, yet in particular parts it seems to contain some sensible observations. As this book is now out of print, I shall quote—from the third edition of it—a few extracts, whenever they may be applicable to the parts of the subject on which I am writing.

In speaking of foundered horses he says:—  
“ Some men talk of horses being chest-foundered,  
“ and shook in the shoulders, when the disorder is  
“ in the feet alone.

“ Wherefore know all men by these presents,  
“ that whosoever talks of horses being chest-found-  
“ ered, or shook in the shoulders, is an ignorant  
“ pretender to the knowledge of this animal, and  
“ is himself shaken in the head.

“ Now to prove the truth of this doctrine,

“ and that shoeing is but a partial good, take this  
“ same narrow heeled, or strong footed horse (which,  
“ because it is fair to the eye, is perhaps called  
“ a very good one) pare down the crust as much  
“ as you can, cut the toe off round and short, and  
“ turn him out to grass barefooted, he will be-  
“ come sound in course of time, if the interior parts  
“ of the foot are not diseased.

“ The true cause of which is, that the foot not  
“ being confined in a shoe, the weight of the horse  
“ expands the same; the crust, and the stricture of  
“ the coronary ring, is relaxed by the dews and  
“ moisture, and the compression on the parts is  
“ removed.

“ And herein alone it is, that the unskilful are  
“ imposed on by the farrier, who (having done  
“ something to your horse, for what he calls a lame-  
“ ness in the shoulder, and ordered him to be turned  
“ to grass) vainly believes such soundness to be the  
“ effect of his remedy; and you, for want of better

“ knowledge of the animal, are persuaded to believe  
“ the same.”

When this case formerly came under a farrier’s hands for any horse of mine, the method which was generally taken with him was, if possible, worse than what might have been done to the shoulder; for a blister was applied to the back sinews, where the powers of action were sufficiently impeded already; and—as of course that did no good—he had recourse to firing, the consequence of which may be easily imagined.

In farriery, practice is too often attempted where theory is totally unknown. Whenever this happens, that branch of business may be considered nearly in the same state of perfection, that surgery had attained, when barbers were the general practitioners. At that time considerable practice was joined to an almost total ignorance of the construction of the limbs. The same general observations which the late Earl of Pembroke has made in re-

gard to horsemanship, may also be applied to the art of farriery. Practice alone, as that noble author observes, can never ensure perfection. But, to use the Earl of Pembroke's expressions, the knowledge of it is vulgarly thought so familiar and so common, that you can hardly meet with a man who does not flatter himself he has succeeded; whereas every science is founded upon principles, and theory must indispensably be necessary. "A blind, " and boundless presumption is the characteristic " of ignorance; the fruits of long study and appli- " cation amount to a discovery of innumerable fresh " difficulties, at the sight of which a diligent man, " very far from over-rating his own merit, redou- " bles his efforts in pursuit of further knowledge."

But as the study of farriery in all its branches has lately been taken up by a gentleman of a liberal education,\* and a college has been founded for the purpose of instructing pupils in that art, I make no doubt that not only individuals, but our cavalry in

\* Mr. Moorcroft.

general, will receive those advantages from their study and practice united, of which this kingdom has been so long in want.

To return to the topic of feet naturally too strong, and the consequent inconveniences on very little work: having permitted some of my horses to be spoiled in the manner I have just mentioned, I still continued unable to ease the complaint, till—far from seeking for the seat of it any where but in the foot—I put in practice the idea suggested to me by Mr. Clarke in the latter part of his chapter concerning hoof-bound horses. My first trial was upon a large coach-horse. Under my own inspection his hoofs were rasped at the heels, and on the quarters, from the coronet to their basis (to a degree just sufficient to prevent drawing blood) and the bottom of the walls on the quarters cut down *flat* by a butteris, as near as the blood vessels permitted. By this the frog, which was before contracted and retired, was brought to bear upon the ground; to promote which the toe was cut off square as much as it could bear.

This operation was performed in a moist pasture, where I let him remain without any sort of covering to his feet, till they were sufficiently recovered to be able to shoe him again. When he was taken up, I found in consequence of what had been done, that his heels had expanded themselves by the power of counteraction, which the weakening of the quarters by the rasp had given to the bars. For the bars, which were before this scarcely visible, were grown large and strong ; the frog was also increased by the flexor tendon having a power to rest on this its natural cushion, which had hitherto been prevented by the contraction of the quarters. Being then required for service, he was shod with as light a shoe as could be ventured. It was bevelled off at the heels,\* so as to contribute as much as possible towards making his frog continue to bear upon the ground. This enabled it not only to get moisture, but friction ; both which, as I have before explained, are essentially necessary towards keeping this cushion

\* For the bevel, see Plate 16, fig. 5.

in a proper state to receive the pressure of the flexor tendon, and thereby to contribute to the ease of it.

If feet of this kind are frequently kept moistened, the walls now and then rasped about the heels, and the bottom of the quarters cut down *flat* when the horse is shod, the cure will in general be effected. Of this I have myself had frequent instances, especially in young horses, which otherwise would soon have become what is called foundered. I have done the same thing with horses whose feet have been contracted by long shoes made in the shape of a walnut shell, and so neglected as to bring on corns. In this case it was necessary to cut away very much with a pen-knife, so as to put the tender part where the corn is seated in such a situation, that the horse could hardly bear the pressure of my finger upon it. The foot has then been bound round with linen, to prevent its being injured by gravel, and the horse has been turned loose for a week or ten days into a shed, with a small outlet to it, previous to turning him

out in a field. In this outlet his feet were kept in their natural state of moisture, which promotes the growth of the foot much more than if he were kept in a close shed. Indeed I have found this sort of shed extremely serviceable on many occasions. But I would have it, if it were upon no other account than merely to preclude the groom's pretence that a horse, when put into a close shed, wants more exercise than he can get there (owing generally to his over feeding him), and that he must be rid upon that account as far as the next *alehouse*.—As I have touched upon the topic of over feeding, which is the occasion of half the illnesses to which horses belonging to gentlemen are subject, I shall just relate a story to that purpose. A gentleman was desired by his coachman to let him send for the farrier to bleed his horses. Being asked by his master, why they wanted bleeding, he alleged only that they had fed heartily and done too little work. His master granted his request; but desired that the apothecary might likewise be sent for. The apothecary

accordingly came, who was ordered instantly to bleed the coachman (who was a very fat man); his master asserting that there was exactly the same reason for the one as for the other.

In respect to hoof-bound horses, I have frequently found that the wall on the inside of the foot is by no means so strong as that on the outside. The pressure on the inner side is also in general the greatest, as appears from the more rapid wear of the inner side of each shoe.

Where horses have the wall on the outside very strong by nature, the inside quarter yields the most to the pressure, which occasions the foot to have a tendency to turn out. To remedy this, I have usually cut the bottom of the outside wall more than the other, and rasped the outside quarter only; and have in general found this to be the best method. I was however completely foiled in one instance, which was the only time I have been tempted to try a different kind of shoe from that which I shall here recommend: having generally found that

shoes made in any particular way, for the sake of favouring this weak part, have been of little or no avail. The instance, in which I was disappointed, is that of a horse kept entirely for the riding-house, and which is consequently almost daily under my own inspection. This horse has very strong feet, one of which was smaller than the other, with the toe turning out and the frog almost wasted. The bars of this foot, before he was last turned out, were scarcely visible, but upon examining them after he had been out about three months, they were found to have increased surprisingly. Notwithstanding this they were not strong enough to counteract the pressure of the quarters ; and the foot itself appeared to be rather decreased, which is contrary to what is usual : for after having been turned out for a certain time they in general become larger. So particular a case led me to turn my mind to a particular method of cure. This I should hardly have found out, if chance had not at that time put into my hands Lieutenant Moor's Narrative of Captain Little's detachment.

In page 93 of this book, is the following passage.

“ The bigotry with which all sects of Hindoos adhere  
“ to their own customs is well known ; still, when  
“ these customs are strikingly injudicious, and totally  
“ abstracted from religious prejudices, perseverance  
“ degenerates into obstinacy, and simplicity into  
“ ignorance. So it is with the Mahrattas, in abid-  
“ ing by their present practice of cutting the hoof  
“ and shoeing horses: they cut away the hinder  
“ part of the hoof, in such a manner that the pas-  
“ tern almost touches the ground, and the frog is  
“ suffered to grow so that the hoof is nearly a cir-  
“ cle, in which form the shoes are made, the hin-  
“ der parts almost touching ; and so thin, that a  
“ person of ordinary strength can easily twist them.  
“ Instead of making the back part of the shoe the  
“ thickest, they hammer it quite thin, making the  
“ fore part thickest, and the shoe, gradually becom-  
“ ing thinner, ends in an edge.

This mode of shoeing, in a country where—from the nature of the climate—the horse’s feet are pro-

bably very strong, did not strike me to be quite so injudicious as the author abovementioned represents it. I determined, therefore, to try on this particular horse a shoe in some respects similar to those above described, that I might see whether it would alter the shape of his foot; since it is said to make "the frog grow so that the hoof is nearly a circle;" which was the very effect that, in this case, I wished to produce. I therefore ordered my smith to make a shoe at my own forge in the form I generally use (which will be hereafter described) with the following exceptions: the web of it was almost to cover the sole, room being given to admit a picker: and—as it proceeded to the heels—the web on each side was to be continued as far as the cleft which separates the bars from the frog. He was to make "the fore part the thickest," and to hammer it so thin at the heels as for it to "end in an edge;" by which "a person of ordinary strength could easily twist it."

This was in the spring of the year 1795. As I was

soon afterwards going to town, I took this pattern shoe with me, and had another made by it of a proper size for the foot of the horse it was designed for. Town I apprehended that this shoe, from being so thin at the heels, would bend in different places, and thereby injure the foot. But as it was constantly under my own eye, I knew that if that circumstance should happen, the injury could not be material in the short time it would be permitted to go unnoticed: but this did not turn out to be the case. After the horse had worn this shoe a day or two only, I found the action of this leg was more free than it had ever been before; for the bars with their covering touched the ground; the extremities of the web on each side, by being so very thin, having bent a little over them. But they were prevented from injuring them by being extended to the cleft which separates the bars from the frog. This pressure of the web upon the bars was an assistance to them in the expansion of the quarters; and the shoe was kept so wide at the heels that the exterior part of it could not hurt him. This shoe therefore

acted exactly contrary to other shoes; which, as I before mentioned, are generally an impediment to the expansion of the heels; whereas this became an assistance to it.

In three weeks I took off this shoe to examine the state of his foot. His frog was found to be increased, and in a better condition than I had ever seen it. The same shoe was therefore replaced for three weeks more; at the end of which time his foot had become considerably larger and straighter. In a week or ten days more, the horse was to go about thirty-six miles on the turnpike road. Although this kind of shoe had succeeded so well in the riding-house, I had some doubts about venturing it on the road; however I at last determined to risk it, and had another shoe put on exactly of the same pattern; in which he performed his journey without any injury, so that I have ever since continued to adopt it; having found it anwser beyond any expectation I had formed of it. For that foot which was before smaller than the other, with the toe turning out, has by the use

of this shoe become of the same size, and so straight that there is now scarcely any difference between the two feet. But I have merely described these particulars, without giving any drawing of the shoe, or venturing to recommend a thing where so much nicety is required. For I have had too much reason to know how easily experiments of this kind can be counteracted by those workmen, who have neither leisure, nor perhaps inclination, to make any experiment succeed, which is attended—as all experiments are—with some trouble; and, if ill managed, with some risk.

The remarks hitherto made refer to heels too high, strong, and narrow. There are others which are too low, weak, and wide. These in general become so by the thinness of the walls, arising chiefly from a colt's being kept on too moist ground, by which the sole often becomes too flat, for want of proper support from the outward walls on each side, to take off from the too great pressure of his weight upon the sole and frog. The foot is in this case short, having

expanded itself too much on the sides, by which it is more liable to injury, and less fit for exertion, than one which by nature has the walls rather stronger and higher ; and which is contracted only sufficiently for the heels to have strength to expand themselves, like a spring, when required to be exerted.

When the first shoes are properly put on upon a colt with a good foot, they are for a time of the greatest service to his spring. For the sole and frog being taken a little from the ground by the shoe, the bones act more upon the flexor tendon, which has thus been deprived of its cushion to rest upon, till the frog is enabled in some measure again to press upon the ground. This may be easily seen by the increased activity with which a colt with good feet, when first shod, lifts up his legs, and bends his pasterns ; and if he is at that time *properly longed*, is an assistance in suppling his shoulders, by giving him an additional power of *opening his arms*.\*

\* Perhaps it may be necessary that I should explain what is meant by a horse's opening his arms. That horse is said to open his arms the

But even when a horse, with so good a foot as that I last mentioned, has been shod for any considerable time, it has frequently a tendency to over-contraction

most, whose muscles have the greatest power of lifting his legs up highest, and whose feet in consequence embrace the greatest portion of ground when they are set down again, either in trotting or in galloping, especially in the longe. For when a colt is *properly longed*, it is the most effectual method of suppling his shoulders, so as to enable his fore feet to embrace the most ground.

If I may venture to say so, the proper method of *longing* a colt is in general too little attended to by gentlemen of the turf, who are apt to think that speed is gained by the spring of the haunches only: yet they have before them abundant evidence that the highest goers (that is, those who have the greatest power in the muscles of their shoulders) are the fleetest. This appeared in the case of Eclipse, and of most of the fleetest race horses. For a horse that opens his arms very much at the time that his fore feet are coming to the ground in full stretch, while his hind feet are in the air, puts his fore feet forwarder—when he sets them down again—than one who does not open his arms so much. Therefore what appears to be lost by the height of his fore action, while in the air, is amply regained by the additional quantity of ground which he embraces when his fore feet come down again. At that instant the muscles of his fore parts are exerted to the utmost, to enable him to bring in his haunches as much as possible, in order that these last may begin to be exerted instantaneously in their turn.

The muscles have so intimate a connection with the feet, by being carried on in tendinous substances quite till they reach the foot bone, that it is also of the utmost consequence for a horse's legs and feet to be

by standing on dry litter in a stable, &c. &c. ; on which account there is sometimes a necessity for turning horses out to grass without their shoes, especially those which are required to do very hard work, and whose shoes are not very well attended to. For when a horse goes without his shoes, there is an increased circulation in the small blood vessels in the lower part of the foot, by the perpetual friction of that part against the ground whenever he exerts himself. The walls are kept more moist by the sole and frog touching the ground. The bars also bearing upon the ground, have more power of counter-acting the pressure of the quarters. All these circumstances added together, have naturally so great a tendency to widen the heels, that—as I before

kept in such a state as will best promote the power of those muscles, upon which all his spring depends.

His feet, when at exercise, should likewise be shod with a shoe which approaches the nearest to a plate shoe,\* if it were only that the cavity of the foot bone might take the firmest hold upon the ground.

\* See Plate XVI. figures 4 and 5, of which I shall give a description in the next chapter.

observed—if the ground upon which a colt is bred be very moist, the heels are apt to be too much expanded. I think I cannot give a stronger illustration of the benefit of sometimes turning a horse out to grass without his shoes, than may be drawn from the foregoing observations. For a proof of the truth of what is here advanced, let a good footed horse that has been kept in the stable, and at work for some time, be turned out to grass for six months without his shoes, and it will generally be found impracticable to replace the same shoes which were taken off, till the heels become a little contracted from the causes I have assigned.

But for want of considering these points, or understanding the construction of a horse's foot, so as to observe the intimate connection between the parts which compose it, and the tendons which come into it; a different method is pursued when the heel is required to be widened, which in process of time tends effectually to ruin the foot. For the general method adopted is to put a bar-shoe on, hollowed at the heel

of it in such a manner, that the frog may rest upon pieces of leather inserted between the heel of the horse and the bar of the shoe.

A bar-shoe is often serviceable for a few days, where a horse is wanted for immediate use after having received some accidental recent injury; but, if suffered to continue beyond that time, makes the foot so extremely tender, besides being productive of other disadvantages which I have before mentioned,\* that a horse who has worn a bar-shoe for any length of time can seldom go with any other. Whereas if ninety-nine out of a hundred of those horses, which are turned out to grass with bar-shoes on, had been allowed to go without any shoes at all, and the moisture of the ground had been permitted to do what the art of man has attempted to perform by causing the frog to rest upon pieces of leather, the foot would in five or six months time have become hard and good, as in the instance I have given.† To prove

\* Page 33.

† Page 37. See also Clarke upon shoeing, p. 73.

more fully the disadvantage of constantly keeping a bar-shoe on, let any one listen to the sound of a post horse's feet thus loaded, knocking against one another when coming to the end of a stage; the agony of which, by the weight of iron his tired legs have to carry, must be very great indeed, but whose misery in this state is frequently but of short duration.

I shall conclude this Section by giving an instance, which occurred to me lately, of the disadvantages here alluded to. Being struck with the miserable appearance of a post horse's legs, as he was led into an inn yard just come in from his stage, I had the curiosity to take up his fore feet in order to examine them; being almost certain that the miserable condition of his legs proceeded from the mismanagement of his feet. He stood very much *over at the knees* ;\* both of which appeared to have been cut with his shoes, but one of them in particular had a raw place on the inside, almost as big as the palm of

\* For the cause of this see page 31.

my hand. His legs were considerably swollen, and full of windgalls: his feet were very strong and extremely contracted: he was shod with a broad webbed shoe, of a walnut shell shape, which had kept the sole entirely from the ground. The walls were considerably overgrown by neglect, and the frog hardly perceptible. The bottom of his foot appeared hollow, except in some parts where there were evidently portions of the sole nearly an inch thick, ready to scale off, but which had hitherto been prevented by the concavity of the shoe.

## SECTION II.

## THE CONSTRUCTION OF THE HIND FOOT CONSIDERED.

THE observations, which I have hitherto been making, have only related to the fore feet. I shall now make a few remarks on the structure of the hind feet, and shall proceed in the next chapter to describe the shoe best adapted to each.

The hind feet are frequently required to support the whole weight and exertions of the horse, while his fore feet are in the air; and indeed in a common gallop, if the rider is seated upon his horse's *back* instead of upon his *shoulders* (which unfortunately is not often the case), his own weight, as well as that of his rider, presses most upon his haunches. The hind feet are therefore somewhat differently constructed from the fore feet, in order to bear so great a pressure. The difference of this construction is what I shall now endeavour to describe.

The nut bone, which in the fore foot was placed in a very inclined position, so as to take its bearing upon the flexor tendon,\* except in the small projecting polished surface in the middle which slides upon the foot bone, has rather a more upright position in the hind foot, and has that projecting polished surface more extended towards its extremities, so as to take its bearing more upon the foot bone.† The whole upper surface of the nut bone is rough, the upper ligaments being attached to every part of it, so as to admit of less fat being lodged upon the anterior upper surface of it, than is lodged upon that part of the nut bone of the fore foot.‡ This position of the nut bone throws the coronary bone also more upon the foot bone, which has rather a wider and deeper socket to receive it than that of the fore foot. The increased pressure of these bones on one another takes the weight almost entirely from the flexor tendon, except at the moment of the horse's spring,

\* See Plate I. and Plate XV. fig. 2.

† See Plate XV. fig. 4.

‡ See Plate II.

when the weight is instantaneously carried back to the nut bone, and to the heels of the foot, so as for the greatest stress at that time to fall upon the flexor tendon. But lest this stress should be too great, the quarters—which in the fore feet were thin and elastic—in the hind feet are very strong, and prevent the expansion of the hind foot, which was required to be preserved to the utmost in the fore foot.\* The hind foot bone is likewise generally wider than that of the fore foot, in order that the coronary bone may have the firmer bearing upon it, though the foot itself—by the contraction of the quarters—is generally narrower; and, as if it were to give additional strength to the heels, the upper processes of the foot bone, especially the exterior ones of each foot, as a colt grows up, almost always become ossified, where in the fore foot they are cartilaginous.† The processes

\* See page 3.      † See an outline of this in Plate XV. fig. 4.

Ossification sometimes takes place in the fore foot also, when the quarters are so strong and narrow as not to admit of expansion. In this case the fore foot is rendered almost entirely unserviceable; but the hind foot—from the difference of the construction of the quarters—is

on each side gain likewise additional strength from their extremities being united by a continuation of this bony substance downwards, which seems to act as a support to them. A branch from the main artery on each side passes here from behind, in the same manner as it does in the fore foot,\* guarded by the union of these processes, which makes it appear as if it passed through a hole in the bone. All this serves to demonstrate the amazing strength that the heels of the hind feet acquire as a colt grows up, in order to support the great weight which falls upon them, and the exertions which they are required to perform.

I have before observed that the walls of the fore feet are the strongest at the toe, where the exertion is the most violent: each therefore has by nature the greatest strength where the exertion is the greatest. The toes of the hind feet are the weakest, as the stress when in action is thrown back upon the quarters. The quarters therefore are the strongest

so far from being injured by it, that perhaps it may be an advantage to it.

\* See page 10.

and narrowst, and the foot itself appears, and generally is, the longest of the two ; which, for the hind feet only, may be equally advantageous to the length of a horse's stroke in the full gallop, as a long foot is said to be to a running footman. The toe of the fore foot, as I have just mentioned, is the strongest, and the quarters the widest and weakest: advantage of each is therefore by good smiths taken accordingly in shoeing; whence arises their saying of where to take the purchase with their nails:

*“Toe before, and quarter behind.”*

Having premised the different construction of the fore and hind feet ; the placing of the nails, and the sort of shoe best adapted to each, will be the subject of the following chapter.

## CHAPTER III.

DESCRIPTION OF THE SHOE THAT IS BEST ADAPTED TO THE FOOT  
OF A HORSE, SO AS TO PRESERVE IT FROM EXTERNAL IN-  
JURY WITH THE LEAST IMPEDIMENT TO ITS SPRING.

HORSES, whose feet are so strong by nature that they do not expand themselves, would in many countries be fitter for service without ever being shod. For besides the disadvantages I have before pointed out, these feet are the most subject to thrushes.

This disease begins in the hoof itself, arising from external moisture being confined in its clefts. I have before observed, that external moisture does not penetrate the hoof in the least, which fact may be easily ascertained by any one. Among the various experiments which I tried in order to be more thoroughly satisfied of it, one day when my cart-horses were just come in from ploughing some very wet land, I ordered the smith to cut several slices from the frog of one of the largest of them ; and although his foot was

very wet at the time, I could not find the least moisture in the slices that were cut off. The outward part of the first slice felt damp of course ; the rest felt warm and dry.

Strong-footed horses generally have the crust of their hoofs very deep. The clefts between the sole and frog, as well as that which divides the frog, are in this case very deep also. Within these clefts the moisture is confined more or less, in proportion to the contraction of the foot. This contraction, as I before shewed, is increased by shoeing, \* which consequently aggravates the disorder called a thrush. This last as it advances affects the skin of the foot. Ulcers are formed in consequence, which—if allowed to spread by the matter being still more confined by the use of bar-shoes —would in time corrode the whole foot ; † but when taken in their early stage, and skilfully treated, may in general be perfectly cured. ‡

\* See Chapter I. p. 47.      † See Chapter I. page 33.

‡ Mr. Bowling, farrier at Henley-on-Thames, makes use of the fol-

In all sandy and rocky countries, such as in many parts of Norfolk, Suffolk, Sussex, Derbyshire, &c. horses with very strong feet would go better without any shoes at all, either before or behind. In this case over-contraction would be counteracted by friction, thrushes would be out of the question, and fewer horses lamed.

Mr. Clarke—as I mentioned before—observes how well horses perform all manner of work, both in Scotland and in Wales, without ever being shod; and I have myself, some years ago, rid hunters in

lowing application. (This I have used for upwards of ten years, and must confess it has never failed.)

Take of clarified honey one pound, the best white-wine vinegar four ounces; mix them together over a slow fire, and when cold, add verdigrease eight ounces; burnt alum and red lead, of each four ounces, pounded very fine; strong spirit of nitre one ounce. Keep stirring them together for a considerable time. If the disease is of long standing, add half an ounce more of strong spirit of nitre.

The method of using it is as follows:—stuff the cleft wherein the thrush is seated with tow, well covered with it. The dressing should be changed every day till the thrush gets well. In the early stage of the disorder a few days are generally sufficient to effect a cure; during which time the horse may do his work as usual.

the sandy part of Germany, entirely without shoes, as it had never been the custom to shoe them.\* I have also been informed that in the flat and sandy parts of Virginia and Carolina, horses are seldom shod, and perform very long journeys without experiencing any inconvenience. Mr. Osmer says: "I believe there are many horses that might travel "their whole lifetime unshod, on any road, if they "were rasped round and short at the toe; because "all feet exposed to hard objects, become thereby "more obdurate, if the sole be never pared. And "some by their particular form, depth, and strength, "are enabled to resist them quite, and to support the "weight without breaking; and here a very little re- "flection will teach us, whence the custom arose of "shoeing horses in one part of the world and not in "another: in Asia there is no such custom as that "of shoeing horses at all, because the feet acquire a "very obdurate and firm texture from the dryness "of the climate and the soil, and do really want no

\* The part I mean is in the territory of the Prince of Dessau.

“ defence. But every rider has a rasp to shorten  
“ his horse’s foot, which would otherwise grow  
“ long and rude, and the crust would most certainly  
“ split.” He goes on by saying, that from the good  
which was found to arise from putting on shoes to  
horses which have naturally weak feet from being  
brought up on wet land, the custom of putting on  
shoes to all kinds of feet became general in some  
countries. “ Our ancestors, the original shoers,”  
says Mr. Osmer, “ proposed nothing more, I dare  
“ say, in their first efforts, than to preserve the  
“ crust from breaking away, and thought them-  
“ selves happy they had skill enough so to do—the  
“ moderns also are wisely content with this in the  
“ racing way.

“ But, in process of time, the fertility of inven-  
“ tion, and the vanity of mankind, have produced  
“ variety of methods, almost all which are pro-  
“ ductive of lameness; and I am thoroughly con-  
“ vinced, from observation and experience, that  
“ nineteen lame horses of every twenty in this

“ kingdom, are lame of the artist; which is owing to the form of the shoe, his ignorance of the design of nature, and malreatment of the foot, every part of which is made for some use or purpose—though he does not happen to know it.”

I have in the foregoing observations pointed out the inconveniences to which strong-footed horses are subject by being shod even in the most skilful manner. Those are most likely to be injured by it which have the hardest work to do in the hottest weather.\* Suppose two racing colts of the same breed, the one with rather sloping pasterns and good feet, and the other with upright pasterns and very strong feet, to be both of them put into training and shod with the sort of shoe which they commonly wear at their exercise; the tendons of the foot bone which proceed from the muscles of the leg, having in the one case their full play, but not in the other, that colt must—*cæteris paribus*—be the fastest goer

\* See Chap. I. p. 21.

in whose feet the motion of the parts is the least confined.

Nothing can be a plainer proof of this than the absolute necessity there is for putting plate shoes on when an exact trial is required. For this I think there can be no other reason than the increase of spring which is gained by the additional power of expansion given to his feet by leaving the heels entirely unconfined. But the strong footed horse, whose feet, by the use of shoes, have been kept in a progressive state of contraction, will by no means reap the same advantage from this circumstance. For if a horse's foot is very much contracted, no power that he can exert will enable it to expand itself immediately by merely pulling his shoes off.

Mr. Osmer, in speaking of Arabian horses, very properly remarks, that the fibres of their muscles being driven into closer contact, they are thereby enabled to move quicker and with more force than other horses; “ their bones being smaller, of more “ solidity, and occupying less space, they are,

“ and can be more easily acted upon by such tendinous and muscular force, and that for a greater duration of time, with less fatigue to these acting powers.” Every thing therefore which tends to diminish this action must, if it were only on this account, be prejudicial; for which reason I have ventured to recommend for a race horse at his exercise, a sort of shoe which approaches the nearest possible to a plate shoe.\* This shoe would be more particularly adapted to horses which have very strong feet; as but little harm could happen to that sort of foot, even if it were never shod at all. For, as I have before shewn, where the bones press too much on one another for want of the expansion of the foot, the motion of the flexor tendon is impeded.† This consequently must decrease his activity, let his *blood* be ever so good.‡ The service of the horse is

\* See Chapter I. p. 25.

† See Chapter I. p. 30.

‡ For an explanation of the word *blood*, I shall refer those of my readers who may be in possession of Mr. Osmer’s book, to his third chapter of part the third, “ against any innate qualities, which the sportsmen call *blood*.”

also generally sooner lost, for inflammation is apt to ensue upon great exertions, which is frequently the cause of an ossification of the cartilages, aided by the compression of the quarters. This inflammation upon the joints of the foot extends to the sheaths which contain the tendons of the foot and produces an increase of the lubricating fluid contained in them, causing that kind of swelling commonly called *windgalls*, which strong footed horses are more subject to than any others, and which blistering or firing can seldom effectually remove, where the spring of the foot cannot be promoted. Strong footed horses therefore upon all these accounts would be better without being shod, wherever they can go without risk. Where shoes are absolutely necessary, the lighter they are the better.

Having made the foregoing observations, I shall now begin to describe that sort of shoe which appears liable to the fewest objections.

For the fore feet the shoe should be made and put on in such a manner as will least counteract the

spring of the hoof. For when this is destroyed not only all entertainment is lost to the rider, but in general the horse begins from that time to be rendered less useful. This is not so with the hind feet, for the reasons I have given in describing their construction: as, therefore, with them the same precaution is not necessary, I have only given a drawing of the fore shoe.

The late Earl of Pembroke very properly remarked, that “ nothing more is wanted than just “ iron enough to protect the outward crust of the “ foot, and to prevent its breaking.” Nor can I better point out the general method of shoeing all sorts of horses, than in the words of the same writer, who observes, that “ from the race horse to the cart “ horse, the same system of shoeing should be ob-“ served: the size, thickness, and weight of them “ only should differ.”

All shoes, for reasons I have before given,\* should be narrow in the web: but the race horse, as the

\* See Chapter I. p. 28.

elasticity of the heels of his fore feet are required to be preserved to the utmost, should have the narrowest web and shortest shoe of all. For the cavity of the foot, when thus shod, is able, when he springs forward, to take the greatest hold upon the hardest and most slippery turf.\*

Every shoe, that is broader in the web than a plate shoe, should be bevelled off as in the plate annexed, † more or less as the hollowness or flatness of the foot requires it. All that is wanted is room enough to admit the picker; if this can be done, you are sure that the shoe does not press upon the sole. All beyond this is hurtful; for when shoes are made concave next the foot, in order as the smiths term it

\* Upon examining race horses' shoes which had formerly been used, I found many of them very long, with nine or ten nails in them, and those pretty close together, and chiefly at the heels, by which there was double the risk of laming the horses in shoeing, and double the tendency to impede their going, by the heels being bound so as to prevent their spring. But this custom I am glad to find is nearly abolished, and a half shoe seems chiefly to prevail.

† See Plate XVI. fig. 4 and 5.

*to take more purchase* on the wall, the inward edges of the shoe must touch the ground before the outward, more or less in proportion to the breadth of the web. This concavity of the shoe has a tendency to contract those parts of the quarters which it touches, by bearing harder upon them than it would do if made flat; and occasions frequently the worst thing that can happen, a convexity of the foot. Of this I have already mentioned a very strong instance which I saw in an old cart horse.\* Smiths are very apt to make their shoes in this manner without occasion; for they never should be made so but when a defective wall renders it necessary; and even then as little as possible; a good foot will otherwise soon become a bad one. So apt indeed are they to commit this fault, that foreigners say of our smiths, that no men shoe a bad footed horse better, nor a good footed horse worse. By this is meant, that they take so much purchase on the crust of a good footed horse, that they soon spoil his hoof; and having spoiled

\* Chapter I. p. 37.

it, they can fasten a shoe on better than any others, by having (mostly in consequence of their own act) oftener occasion to exert their art in driving to a nicety much smaller and finer nails than are made use of in any other country.

No shoe should bear upon any part of a horse's hoof except the outward wall, as the preservation of the wall is all that is required; the rest of the shoe should be bevelled off, so as to constitute that part which is called the web.

Innumerable blood vessels, as I before described,\* surround the whole foot bone, and form at the extremities of it a fine pile like velvet, for the purpose of sensation. These—with the skin which surrounds and receives them†—come in contact with the laminated substance of the wall,‡ and with those parts of the sole which are connected to the wall. The position of the fibres at the toe, and on the quarters of the hoof being the most upright, are best able to

\* See Chap. I. p. 9, 10, 11, 12.

† See Plates VIII. IX. X. XI. XII. XIII.

‡ See Plate XIV.

resist the pressure of the shoe. Towards the heels the fibres are more slanting ; and as the walls of the fore feet are weakest on the quarters, the heels of the shoe may hurt those parts if it be not kept wide enough, and if made thicker there than at the toe ; and most of all when cramps are permitted. In the two last cases the weight of the horse, every time he sets his fore feet to the ground, falls upon those parts of the outward wall which are least capable of bearing it. This occasions such a pressure on that part of the crust which is the thinnest, that it has not the same power of resisting the jar. The wall therefore gives way in these parts ; in consequence of which, when the fore shoes are not kept wide enough at the heels, all the pressure and jar, when the foot is exerted, falls upon those parts of the heels of the horse which come next in contact with the sole and wall. These I have shewn to be the cartilaginous extremities of the foot bone,\* which are surrounded with blood vessels, and are the

\* See Plate VII.

delicate parts of sensation. If the shoe keep a constant pressure on these delicate parts (which pressure is perpetually increasing where the outward wall yields to it) the blood vessels, which surround the extremities of the foot bone, become so much bruised that their circulation is impeded, and the sensation of the foot is as much destroyed by it as the sensation of the human finger would be by being continually pinched. This is very visible, if that part of the sole immediately in contact with them be pared to the quick, when a horse has that grievance occasioned by it called a corn. In proportion as the shoe wears out so this grievance increases, by the shoe's pressing more upon the heels. For a shoe, when nearly worn out at the toe, is generally almost as entire at the heels as when new.

If a shoe touches the sole at the toe by not being properly bevelled, though the substance of the sole is hard at the toe, yet it has not the same power of resisting a continual pressure as the wall has. The parts of sensation therefore, immediately

above where the sole comes in contact with the wall,\* must in this case be liable to be injured. The pain caused by the pressure of the shoe upon the sole is sometimes perceived as soon as a horse is shod, by his uneasy manner of going; at other times it does not discover itself till the sole is still more compressed by exertion.

A shoe for a good footed horse cannot be made too flat; it should be rather narrower at the heels than at the toe, and of sufficient substance in proportion to its size to prevent the iron from bending.

A *fuller*† is perhaps of service to protect the heads of the nails, and should be made nearer or further off from the edges of the shoe, in proportion to the thickness of the wall; but it has its disadvantages. For where the fuller must be very near the edge, as in the case of a thin footed horse, it contributes to wear out the shoe more rapidly at the toe. It may also, as the Earl of Pembroke observes, "cause

\* See Plate VIII.

† See explanation of Plate XVI. fig. 2.

a partial yielding." When a groove is made round the edges of a shoe, an even purchase of the wall must be taken throughout; whereas, in a bad foot a greater hold might have been taken on some parts of the wall to save the others.

Smiths are in general apt not to put the fuller *coarse* enough, in order, as they say, that their work may look neater. The nearer the fuller is put to the edges of the shoe, the higher the nails are obliged to be driven, to take their hold; and consequently the more liable they are to injure the foot. If the fuller be put more *coarsely* (that is, not so near the outward edges of the shoe) the nails must be driven more slanting, and not so high; they consequently take more hold of that part of the hoof, where the crust is the thickest, and are not so liable to fall out. No nation I believe—except the English, and those who imitate the English—make a fuller to the shoe: but instead of making the holes upon an even line, they put them more or less on the out-

side of the shoe for a bad footed horse, in proportion to the hold they can venture to take. This they call *percer gras* or *percer maigre*.\* These holes should be made at twice, first by punching (or, as the smiths term it, *countersinking*) a large hole not quite through, for the head of the nail to lodge in, and then by piercing a smaller hole with a different instrument for the rest of the nail to go through. The heads of the nails will by this method be better protected, and kept in much stronger than when a fuller is made for them.

From not attending to the foregoing circumstances, smiths are often induced to put on a longer shoe than is necessary on a bad footed horse, that they may be able to put their nails at the heels, where the hoof, not being so brittle as at the toe, more readily admits them to take hold; and where they place them as thick as they can, the disadvantages

\* M. Lafosse in the quarto edition of his *Guide du Maréchal*, Part V. chap. II. article iv. in treating upon this subject, uses the word *étamper* instead of *percer*.

of which I have before shewn. No shoe, for any horse whatsoever, should have above eight nails, which should be placed on each side—near the toe before, and on the quarters behind—at even distances on a good footed horse; and on a bad footed horse at uneven distances; by which I mean wherever the walls on a bad foot will admit of purchase being taken on them.

I have before spoken of the bad effects of cutting away the binders, and of paring the sole. Whenever this is permitted beyond what will just take off the ragged edges, or that part which is just ready to scale off, it is quite immaterial what sort of shoe is put on.

I now come to that method which I have practised for some years past; having begun by that constant and laborious attention which is always necessary in order to combat any inveterate custom, till at length, by great perseverance, I prevailed to have it used. The method I mean is that of adapting the shoe to the foot; to illustrate the propriety of which I cannot do better than quote the words of Mr. Osmer,

who says on this subject,—“ Let the shoe on every horse stand wider at the points of the heels than the foot itself, otherwise, as the foot grows in length, the heel of the shoe in a short time gets within the heel of the horse, which pressure often breaks the crust, produces a temporary lameness, perhaps a corn.”

The length of the shoe, of which I have given a drawing,\* will explain itself; if in fitting it on, after allowing for paring off some of the toe when necessary, you make a point of cutting off the heels of the shoe, where they cease to bear upon the foot. This is the best method of calculating how long or how short a shoe ought to be; except that for a race horse, or for a manage horse, they should be made shorter, that their heels may have a greater power of expansion by being unimpeded. If a shoe be made longer at the heels than where it touches the heel of a horse, the smallest part of it—which projects beyond the bearing—only serves as a lever to

\* See Plate XVI. fig. 2.

pull it off, every time the horse treads upon uneven ground. If it is made wider than I here recommend,\* the horse would have a power of treading upon it with the opposite shoe; which I have never known to happen during some years, in which I have tried it on horses of almost every kind, in almost every kind of country, when the shoe was put on well, and of a proper length. The shoe must not begin to be wider than the foot till it comes towards the heels, lest it should be liable to the inconvenience abovementioned.

An additional advantage of this method is, that it hardly allows a possibility of stones or gravel being harboured at the heels; as the heel of the foot rests on the centre of the heel of the shoe; and consequently leaves but half the space for admitting the gravel. The bevel of the shoe likewise comes nearer to the wall in that part, which decreases the probability of pressure on the sole. This also renders it impossible for the heel of the horse to grow

\* See Plate XVI. fig. 1.

over the heel of the shoe. With the utmost neglect it can only injure the outward wall, which will presently renew itself; the bevil totally preventing that pressure on the sole, which is the chief occasion of corns.

I have frequently bought horses whose feet, upon a strict examination, proved to have corns, occasioned by ill made shoes having pressed into them. These were, in general, easily cured by paring their feet properly where the grievance lay,\* and turning them out without their shoes for two or three months; and afterwards shoeing them in the manner I have just described. I now indeed seldom scruple buying a horse because I hear that he has corns (unless they are apparently so bad as to have injured the internal parts of the foot), if it be a horse of sufficient value to make it worth my while to pay a constant attention to his shoeing; otherwise the injury he receives, by being once ill shod, is greater than the benefit he can receive by being well shod for six

\* See page 54.

months; especially if the most destructive of all practices be also adopted, which is that of putting the shoe on hot. This is forever done in the smiths' shops in London, where there are frequently too many horses at once in proportion to the number of hands that are to shoe them; and where—in consequence of the hardness of the work—there is a pretty free circulation of the porter pot.

I shall mention an anecdote, related to me by a late noble general officer, which proves that this practice is not unknown in the army. This noble Lord, having frequently discovered the farrier putting the regimental horses' shoes on hot, by way of expedition, told him that he would give him a guinea if he would promise to leave off so bad a practice; provided—that if ever he caught him at it again—he would permit him to put the shoe on hot upon a certain bare part of the farrier, instead of on the horse's foot. The guinea was accepted on this condition; the circumstance soon happened again from custom, and the shoe was literally applied hot

to that very part of the farrier, according to agreement.

This practice is not only detrimental to the horse on account of the heat, but also spoils the shoe itself; which—being thus left, instead of being well hammered while it is cooling—wears away like lead. Mr. Clarke very properly observes, that a shoe should be made of good iron, and be well worked, or what the smiths call hammer-hardened, that is, beat all over lightly with a hammer when almost cold. This is so little practised with us, that if a smith be sent for—a mile or two from his shop—to shoe a horse, and bring a shoe that does not fit, it seldom happens that he knows how to hammer it, when cold, so as to make the alteration it may require. He is therefore obliged either to go back to his shop, or to put the shoe on the horse in the same state that he brings it, whether it fits him or not, and to take it off again as soon as an opportunity serves. Mr. Clarke also observes, that the Spanish and Portuguese farriers use this practice greatly, insomuch

that many people, who have seen them at work, have reported that they form their horse shoes without heating them in the fire as we do. This may in some measure account for their horses not suffering so much by long broad webbed shoes; for when they are so thoroughly hardened, they acquire a greater degree of elasticity, and are made with less iron. Though a shoe while it is hot, may appear too small for the foot for which it is intended, yet it will stretch by dint of hammering while it is cooling, more or less, in proportion to the goodness of the iron. As the shoe therefore is, in this case, made more durable with less substance, the horse has less weight to carry, and the spring of his foot is less impeded than it otherwise would be when the web is made broad. For the shoe, by the elasticity which it acquires, has a power of yielding in some measure to the spring of the foot, without injuring it; which would not be the case if either made of too soft iron, or if not well hammer-hardened. Indeed I have before given a singular instance in which the

expansion of the foot was promoted by a broad webbed shoe, when made so thin as for the iron to bend.\* But, except in this particular case, a broad webbed shoe is not only unnecessary, but hurtful, for the reasons which I have before assigned.

For the hind feet the shoes should be made rather longer, and should follow the shape of the foot; since the crust is hardest upon the quarters behind.† There is also little or no elasticity in the hind quarters; the danger therefore is less, upon both these accounts, if the shoes get into the feet. The hind quarters also being stronger, the shoes may be permitted to be turned up if required. This may be done with more effect, and certainly with less injury to the foot than the fore shoes, for the following reason.

In the fore foot, if the frog be permitted to come to the ground sufficiently, this cushion, which nature has given to the foot, will more effectually

\* See Chap. II. page 57.

† See Chap. II. Sect. II.

prevent it from slipping upon a hard uneven surface than any cramps whatsoever: for cramps to the heels of the fore shoes, besides the injuries which they occasion to the foot, prevent its cavity from taking the proper hold upon the ground. If the foot of a cloven-footed animal—a goat for instance—were to be covered with a flat piece of iron, with the sharpest spikes made to it, I much doubt whether it would be able to stand on those pinnacles of a slippery mountain, which the power of expansion in its hoof enables it to embrace. A horse may be said to have a foot half cloven, that is to say, a foot having the power of expansion at the clefts of the heel, but confined at the toe. When a horse therefore happens to set his foot on a large pebble, or on an uneven-pointed stone in a paved street; his heel—which for reasons before given,\* will receive no injury from that stone, when shod in such a manner as to be able to expand itself—will be less liable to slip upon it than if

\* Page 27.

covered with a shoe with cramps to it, the points of which only contribute to make the bearing of the shoe more uneven, where from the hardness of a pebble, or of an irregular pavement, the shoe is not able to enter it.

The heels of the fore feet should therefore—on this, as on many other accounts—be permitted to expand themselves by having that sort of shoes on which produces the least impediment. To prevent the fore feet from slipping in frosty weather, the heads of the nails on each side nearest the toe may be made rather large, so as to project above the holes made to receive them in the shoe,\* all beyond this is, more or less, injurious to the foot. The projection of these nails, as long as they last, are a great assistance to those parts of the fore feet on which a horse—both in drawing and in galloping—lays his greatest stress. By this method, that part of the shoe, which by friction against the ground soon becomes smooth, will be considerably

\* These are what commonly go by the name of *frost nails*.

assisted, when a horse has to tread on a hard or slippery surface; and the heels of his fore feet will be better guarded by their own formation than by any expedient of art which can possibly be brought to their assistance.

The Earl of Pembroke says, “ In very greasy, “ wet, or loose kind of slippery soils indeed, where “ the ground easily gives way, and lets the foot in, “ without however holding it in very strongly, “ turning up before may be useful.” When a hunter, for instance, is required to go in a country of this kind, only while it is in this state, there may be no danger in taking his heels a little from the ground; for a horse’s heels—if he has been bred, or is constantly used in that country—might be apt to be too much expanded; “ but,” he continues, “ in a hard country, where the foot cannot enter “ the ground, cramps before are very hurtful, and “ quite useless; the tendon being by them elevated, “ and therefore constantly straining itself for want “ of a basis to rest on, they endamage the sinews

“ very much, and cause windgalls, lameness, swellings on the bullet, and weaknesses, &c. almost as much as the walnut-shell shaped shoe, which is held in such high esteem by bad farriers, and their ignorant stable followers.”

From the conviction I had of the use of short shoes on the fore feet of those horses, merely kept for the riding-house (for none are in this case required for the hind feet) arose my first endeavour to bring them into general use. In this I at first repeatedly failed, by the shoes getting into their feet; till I became well enough acquainted with the right method of making them, to be able to give directions to the smiths sufficiently precise. For these men always wished to counteract me, because I ventured to alter a method, which they and their fore-fathers had so long practised. I found this to have been likewise the case with many other gentlemen, who used to come into the riding-house, and say to my old friend Sir Sidney, “ we have tried your short shoes, and they wont do.”

Having been convinced by experience of the benefit of the shoes here recommended, and having seen the want of success in those who wished to put this method in practice, I next began to consult those who had written upon shoeing. I found that Mr. Clarke (who did the late Sir Sidney Medows and myself the favour of presenting his book to us) mentions having endeavoured to introduce into practice the method here recommended, long before Mr. Osmer's treatise appeared, which he quotes on the "subject; but," he goes on by saying,\* "so much are farriers, grooms, &c. prejudiced in favour of the common method of shoeing and paring out the feet, that it is with difficulty they can even be prevailed upon to make a proper trial of it." He has therefore, probably on that account, only stated the advantage of it, without venturing to give as a pattern any other shoe than that, which in every part of it follows the shape of the foot.†

\* Clarke, page 63.

† Clarke, third edition, Plate I. fig. 12 and 13.

In what I have here written, I have only endeavoured to bring that method of shoeing into general use, which has hitherto been but partially adopted. I have therefore, throughout, preferred quoting from other authors on this subject, where my opinion has agreed with theirs, to writing my own sentiments; as they have shown particular circumstances in as strong a light, and possibly explained them in better words than I could.

Having likewise shown that I have reason to be no less convinced, than any writers who have preceded me, of the prejudice of farriers, grooms, &c. in favour of a method of their own, I am as well aware of the difficulty of bringing into general use what I have here recommended, as my predecessors have been; though by the length of time I have persisted in it, and by the many instances I have mentioned, I am convinced it is of the utmost consequence to those individuals who are lovers of horses, and perhaps may be worthy of the attention of those who are concerned in the national cavalry.

I shall think myself amply repaid for my trouble, if my labours, as I sincerely hope they may, turn out to be of service to the public; as I am no less convinced that there wants a reformation in the manner of shoeing horses, than the late Earl of Pembroke was that a reformation is required in the manner of riding them.

As no treatise can ever be said to be perfect, and as this may perhaps be deemed to be as little so as any, I shall finish these observations by saying to my reader, as Horace says to his friend at the conclusion of one of his poems:

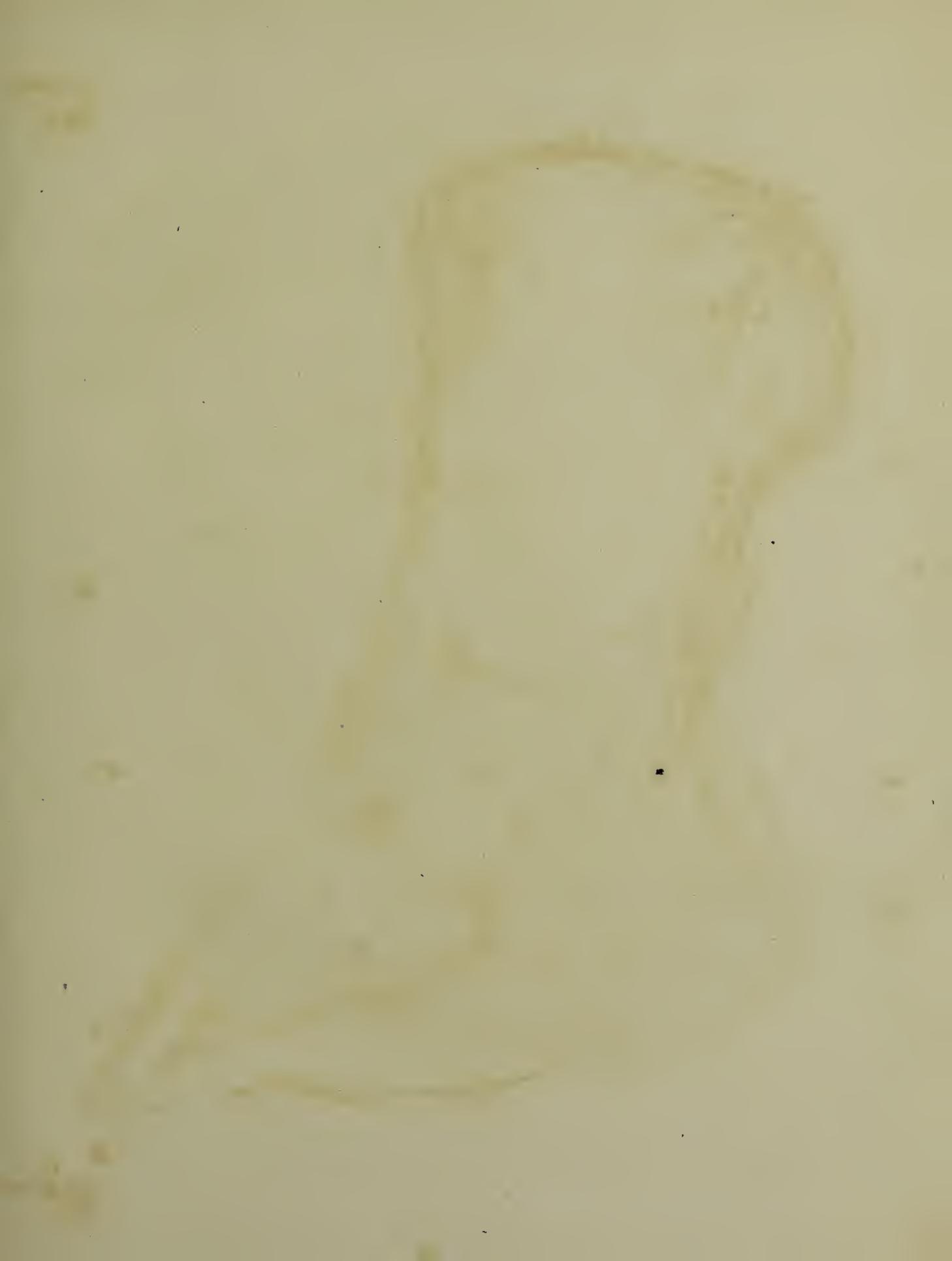
—*Si quid novisti rectius istis,  
Candidus imperti; si non, his utere mecum.*

THE END.

---

ERRATUM.—Page 85, line 1, for *are* read *is*.







## PLATE I.

A section of the fore foot of a horse, to shew the relative situation of the bones, and the attachment of the tendons of the different muscles.

- a* The pastern bone.
- b* The coronary bone.
- c* The nut bone.
- d* The foot bone.
- e* A ligament uniting the nut bone and foot bone.
- f* A hollow behind the coronary bone, filled up with fat.
- g* The projecting part of the nut bone, which moves upon the foot bone.
- h h* The tendon of the extensor muscle of the coronary bone.
- i i* The tendon of the extensor muscle of the foot bone.
- k k* The tendon of the flexor muscle of the coronary bone.
- l l* The tendon of the flexor muscle of the foot bone.
- m* The sheath in which the tendon of the last muscle is inclosed.
- n* The cellular membrane, which is interposed between the two flexor tendons.
- o o* A fatty and ligamentous substance, forming a cushion between the flexor tendon and the frog.





G. Willard del.

W. M. Kellon sculps.

London Published as the Act directs Jan: 1. 1796. by S. Freeman Esq<sup>r</sup>





FIG. 1.

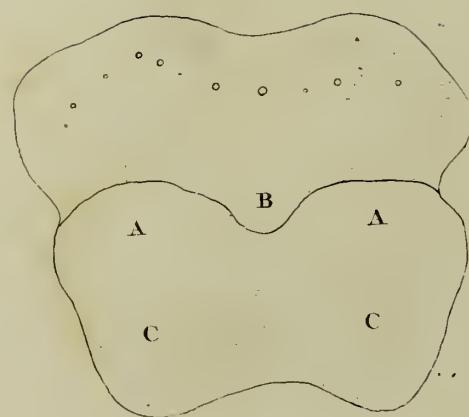
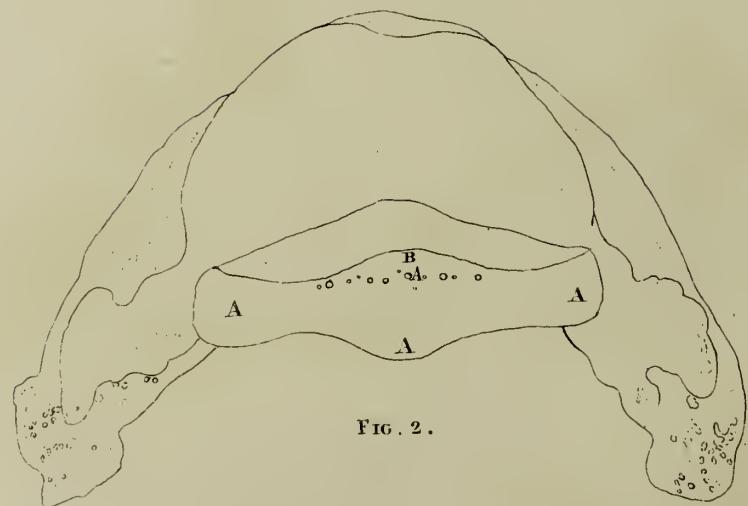


FIG. 2.



## PLATE II.

Fig. 1.

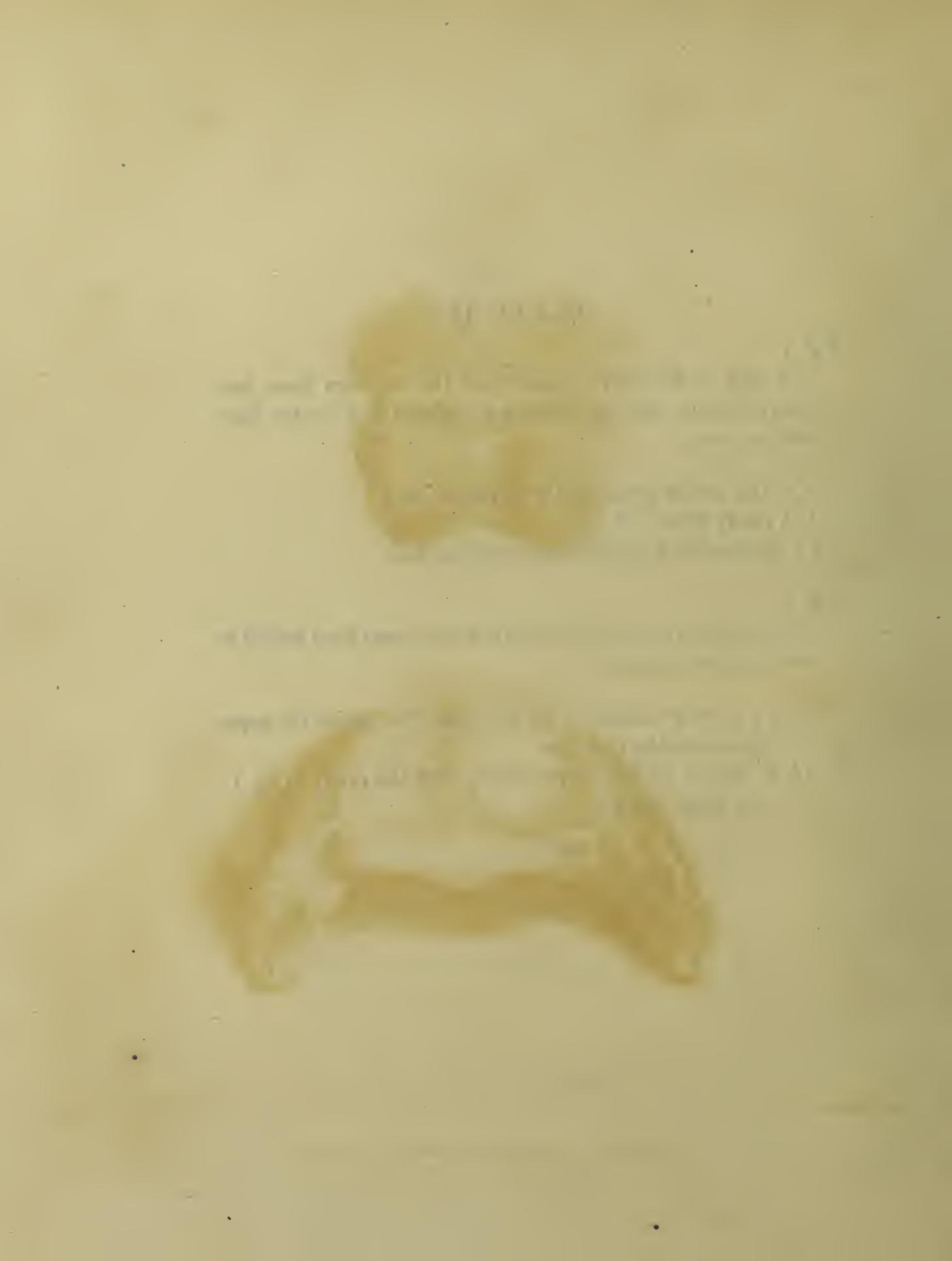
A view of the lower extremity of the coronary bone, seen from behind, to show the surfaces articulated with the nut bone and foot bone.

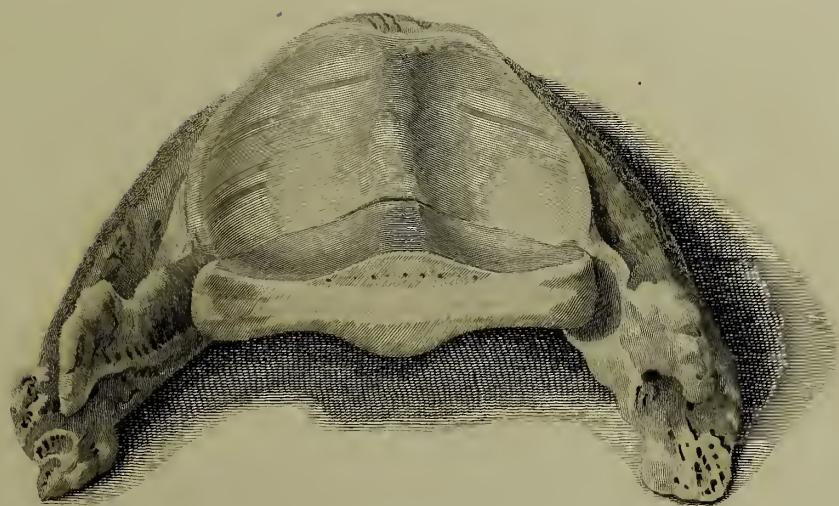
- a a* The surface articulated with the nut bone.
- b* A cavity filled with fat.
- c c* The surface articulated with the foot bone.

Fig. 2.

A posterior view of the nut and foot bone, seen from behind in their relative situation.

- a a a a* A rough surface of the nut bone, from which the upper ligaments take their rise.
- a b* A smooth surface corresponding with the cavity in fig. 1. at *b*, filled with fat.





*G. Turtland. del.*

*W. Skelton. sculp.*

London Published as the Act directs Jan 1. 1796 by S. Freeman Esq.



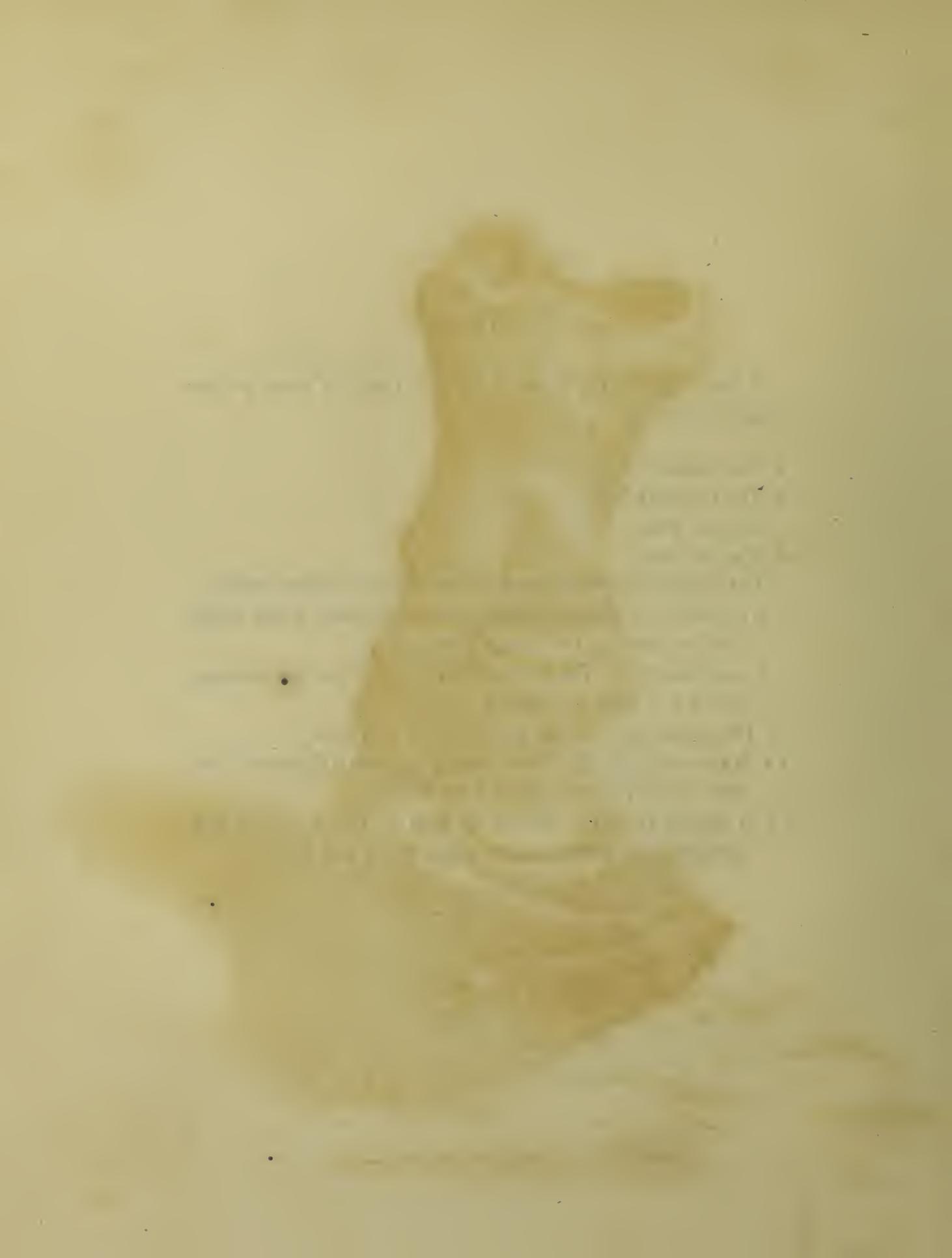




### PLATE III.

A front view of the bones of the fore foot of a horse in their relative situation.

- a* The pastern bone.
- b* The coronary bone.
- c* The nut bone.
- d* The foot bone.
- e* The point of insertion of the tendon of the extensor muscle.
- f* A concavity to give attachment to the ligament which unites the foot bone to the coronary bone at *g*.
- h* A continuation of the same concavity, to which the cartilage of the foot bone is attached.
- i i* The upper and lower processes of the foot bone.
- k k* A groove in the foot bone, which receives a division of the main artery, coming round from behind.
- k l* A groove receiving another division of that artery, which proceeds round the extreme edges of the foot bone.





G. Kirland del.

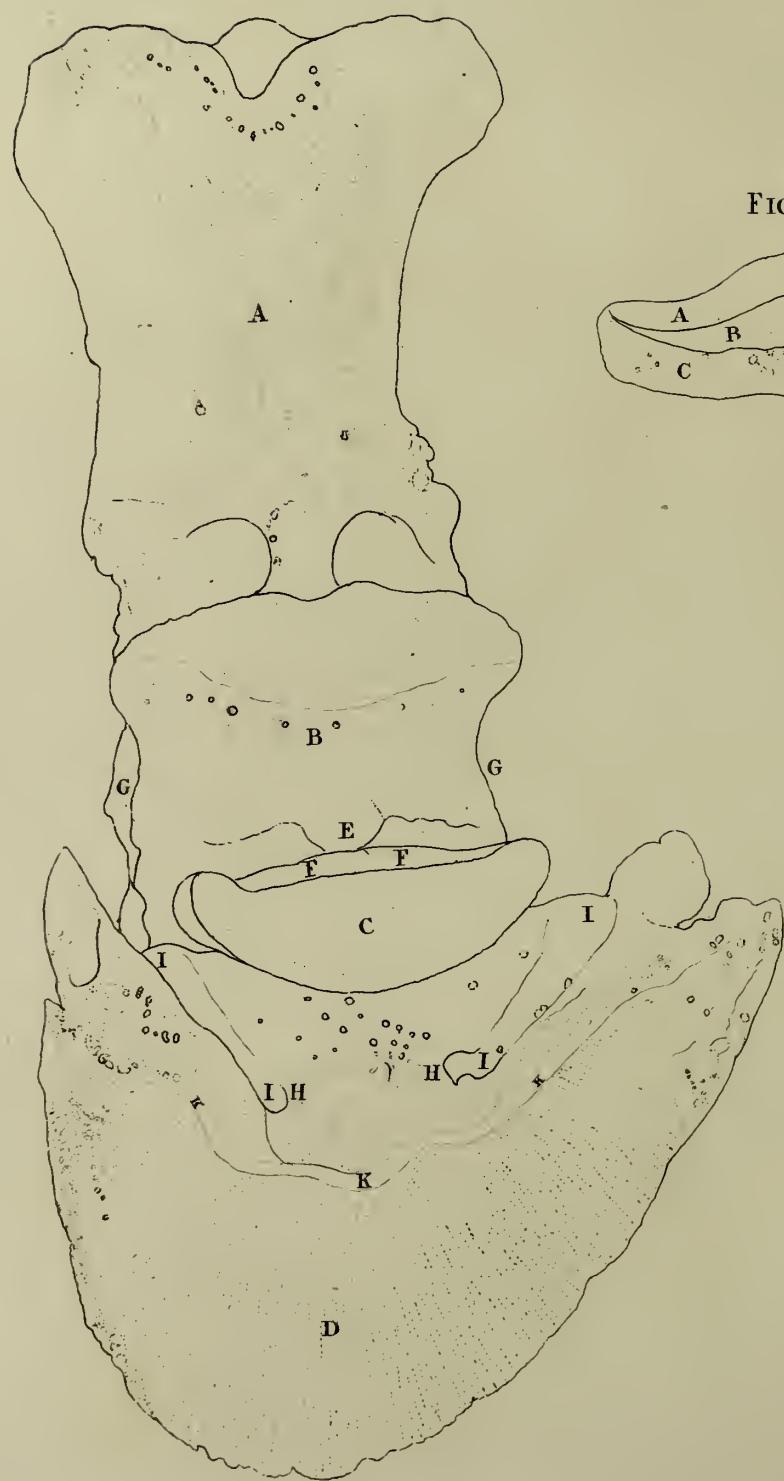
C. Blae sculpt.

London Published as the Act directs Jan<sup>Y</sup> 1<sup>st</sup> 1796 by S. Freeman Esq<sup>r</sup>



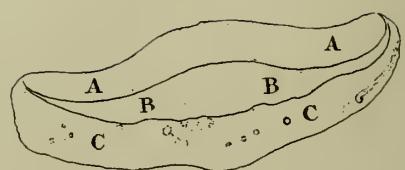


FIG. 1.



Pl. 4.

FIG. 2.



## PLATE IV.

Fig. 1.

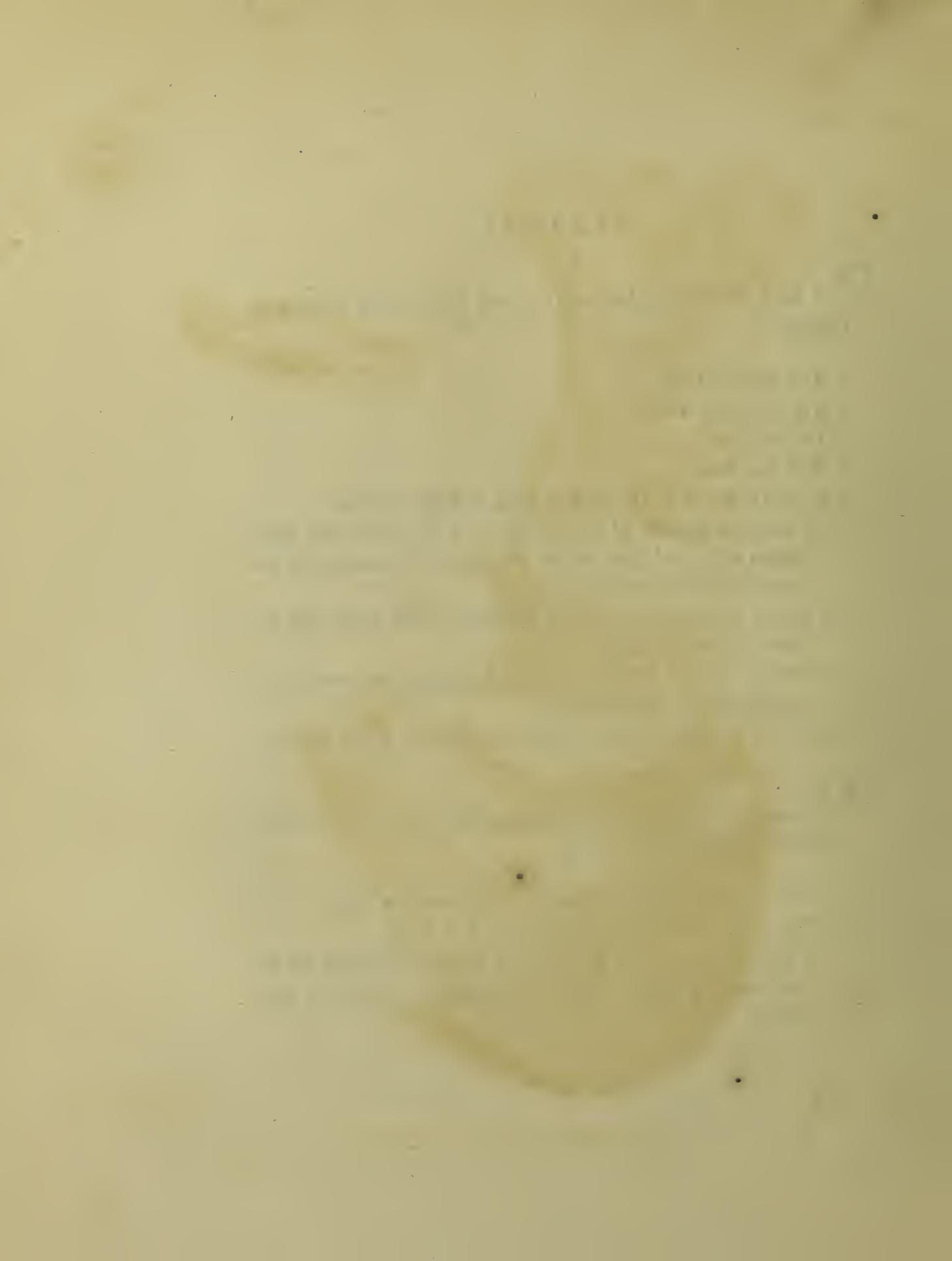
A back view of the bones of the fore foot in their relative situation.

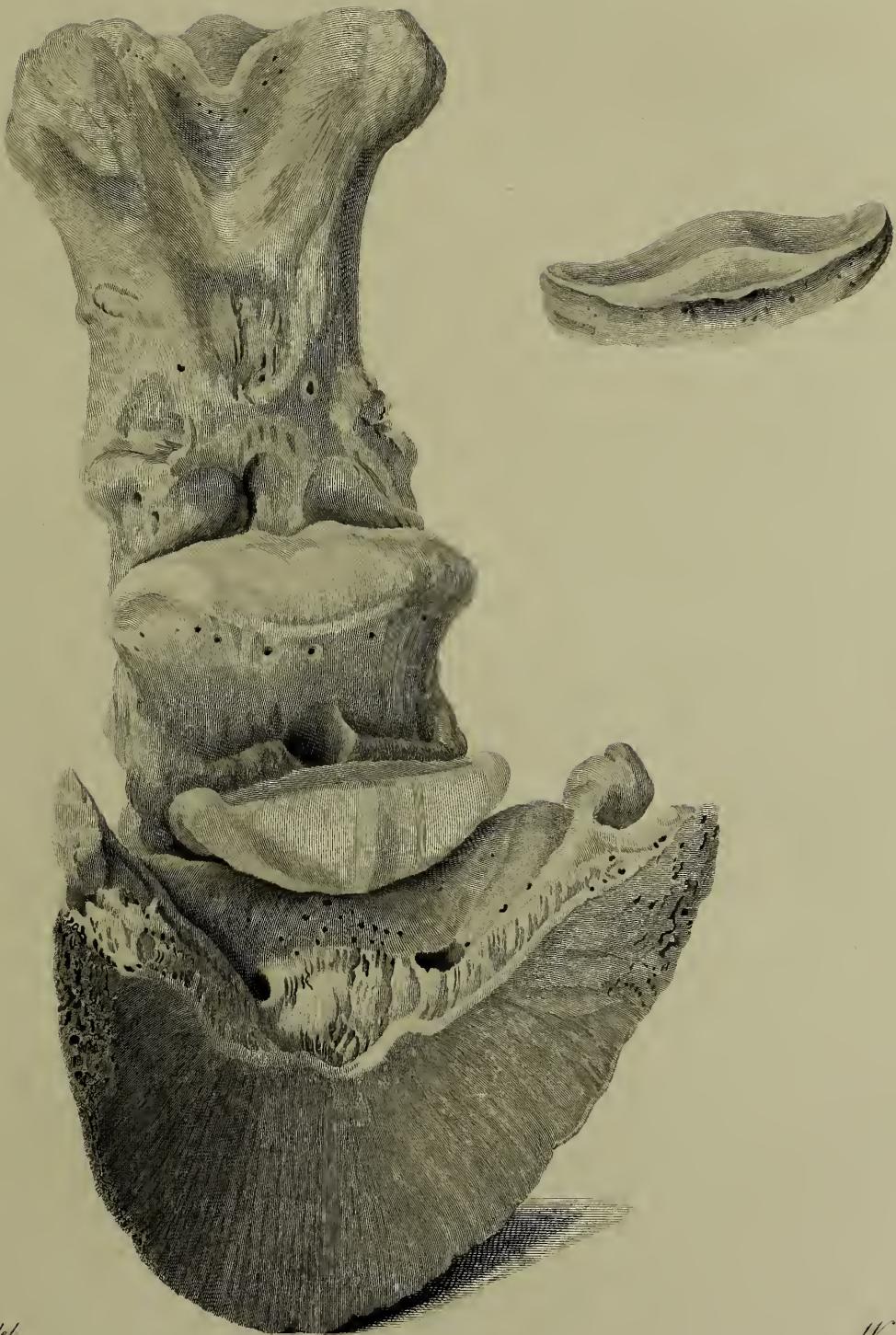
- a* The pastern bone.
- b* The coronary bone.
- c* The nut bone.
- d* The foot bone.
- e* A cavity, which in the natural state is filled with fat.
- ff* The upper surface of the nut bone, from which two ligaments arise, and pass round the lateral depressions in the coronary bone, marked *g g*.
- bb* Points of attachment of the ligament which unites the nut bone to the foot bone.
- ii* Two grooves in which two main trunks of the arteries are continued into the foot bone.
- kkk* The line of insertion of the tendon of the flexor muscle.

Fig. 2.

A view of the anterior and inferior surfaces of the nut bone detached from the other bones.

- aa* The anterior surface opposed to the coronary bone.
- bb* The inferior surface opposed to the foot bone.
- cc* A posterior portion of the inferior surface excavated for the purpose of giving a firmer attachment to the lower ligament.





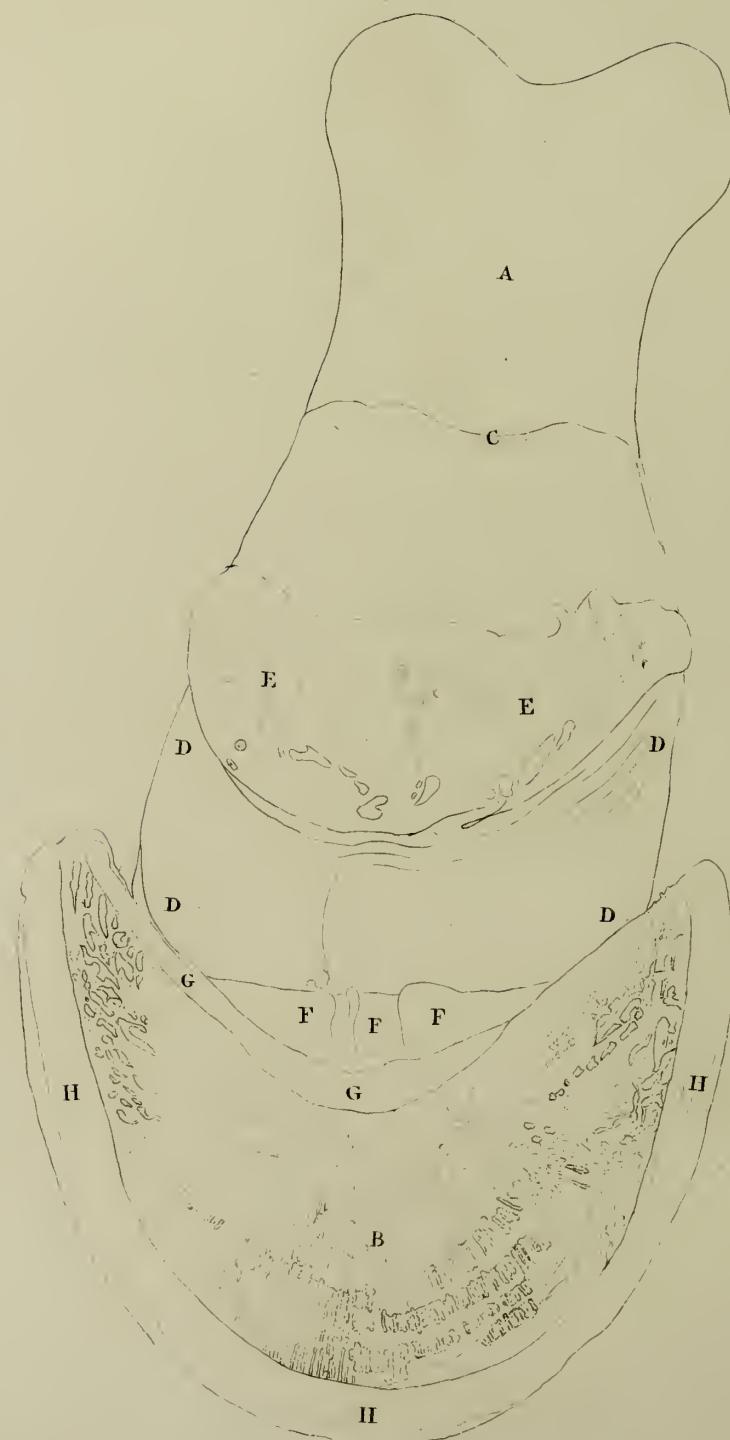
G. Kirtland del.

W. Skelton sculp.

London Published as the Act directs Jan 1<sup>st</sup> 1796 by S. Freeman.







## PLATE V.

A posterior view of the bones of the fore foot, to shew the ligaments of the nut bone.

- a* The pastern bone.
- b* The foot bone.
- c* The cut end of the tendon of the flexor muscle of the coronary bone.
- d d d d* The upper ligaments of the nut bone, as they pass round the sides of the coronary bone.
- e e* A thin expansion from the ligaments *d d d d* covering the mass of fat lodged in a cavity in the coronary bone.
- fff* Attachment of the lower ligament of the nut bone to the foot bone.
- g g* The tendon of the flexor muscle cut off at its insertion into the foot bone.
- b b b* The natural surface of the villi continued from the true skin.





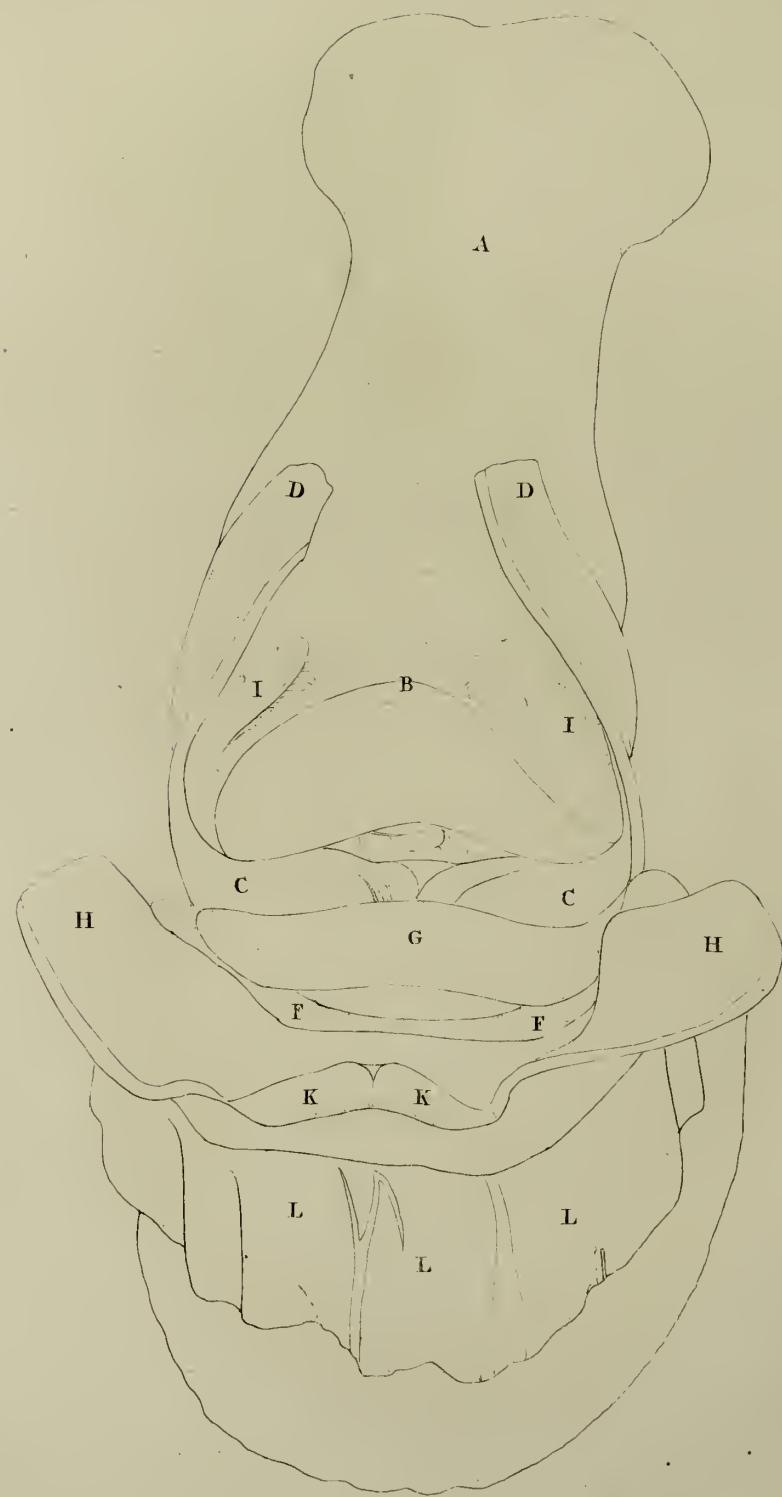
G. Kirtland del.

W. Skelton sculp.

London Published as the Act directs Jan<sup>Y</sup>. 1<sup>st</sup> 1796 by S. Freeman Esq<sup>r</sup>







## PLATE VI.

A front view of the bones of the fore feet, to shew the ligaments.

- a* The pastern bone.
- b* The coronary bone raised from its natural situation, to shew the upper ligaments of the nut bone at *c c*, which pass round each side of the coronary bone, and are lost upon the anterior surface of the pastern bone at *d d*.
- e* The foot bone bent forwards, to show the lower ligaments of the nut bone at *ff*.
- g* The nut bone.
- h h* Ligaments that unite the coronary bone to the foot bone.
- i i* The surfaces to which the ligaments *h h* are attached.
- k k* The tendon of the extensor muscle cut off at its attachment to the foot bone.
- l l l* The skin turned down to expose the ligaments.





G. Kirtland del.

W. Skelton sculp.

London Published as the Act directs Jan<sup>r</sup> 1<sup>st</sup> 1796 by S. Freeman Esq<sup>r</sup>.





FIG. 1.



FIG. 3.

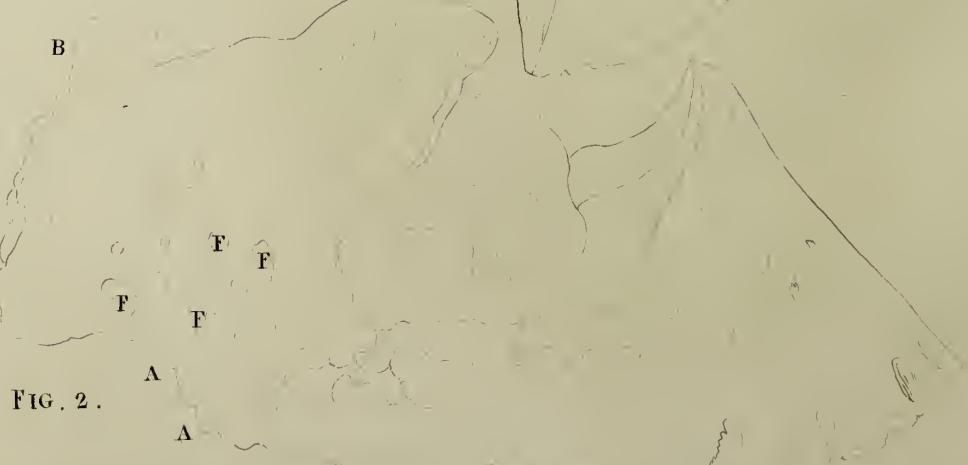


FIG. 2.

## PLATE VII.

Three views of the cartilages of the foot bone of the fore foot, attached to the bone.

Fig. 1. A view of the inner side of the cartilage.

Fig. 2. A view of the outside of ditto.

*a a* The part of the cartilage which terminates by a small curve, and over which those parts of the hoof are carried which are called the bars.

*a b* Those parts of the extremity of the cartilage which are connected to the under surface of the foot bone.

*fffff* Holes for the passage of blood vessels.

Fig. 3. A view of the cartilage from the sole.

*c c* Upper posterior extremities of fig. 2. *a b*, the posterior edges of which are connected to the under surface of the foot bone at *d d* by a fatty ligamentous substance, which serves as a cushion to the flexor tendon *e e*, and is what is commonly called fleshy frog.





G. Kirtland del.

W. Stinton sculp.

London Published as the Act directs Jan 1<sup>st</sup> 1796, by S. Freeman Esq<sup>r</sup>







## PLATE VIII.

A view of the posterior surface of the foot, to show the arteries and veins. In the sketch the arteries are shaded, the veins are not.





G. Kirtland del.

W. Skelton sculp.

London Published as the Act directs Jan<sup>7</sup> 1<sup>st</sup> 1796 by S. Freeman Esq<sup>r</sup>







## PLATE IX.

A side view of the foot, to shew the arteries and veins. In the sketch the arteries are shaded, and the veins are not.





G. Kirtland del.

W. Skelton sculp.

London Published as the Act directs Jan<sup>Y</sup> 1<sup>st</sup> 1796. by S. Freeman Esq<sup>r</sup>







## PLATE X.

A view of the under surface of the foot bone, with its cartilages and fleshy frog. The skin which immediately covered the whole is removed, and exhibited in the next plate.

*aa* Cut edges of the skin.





*G. Sirtland del.*

*W. Skelton sculp.*

London Published as the Act directs Jan<sup>Y</sup>. 1<sup>st</sup> 1796 by S. Freeman Esq<sup>r</sup>.







## PLATE XI.

The skin taken off from that part of the hoof exhibited in  
Plate X.





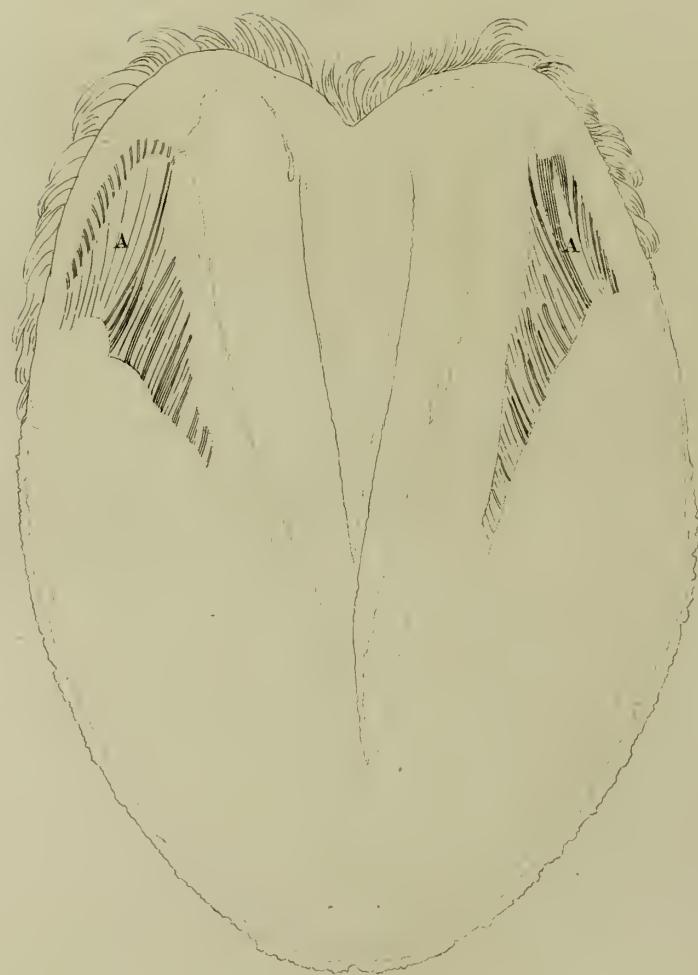
G. Kirtland del.

M. Stetton sculp.

London Published as the Act directs Jan<sup>Y</sup> 1<sup>st</sup> 1796, by S. Freeman Esq<sup>r</sup>.







## PLATE XII.

The under surface of the foot, seen in its natural situation,  
the hoof having been removed.

*aa* Continuation of the fibrous structure which covers the an-  
terior surface of the foot.





G. Kirtland del.

W. Skellon sculp.

London Published as the Act directs Jan<sup>Y</sup> 1<sup>st</sup> 1796, by S. Freeman Esq<sup>r</sup>





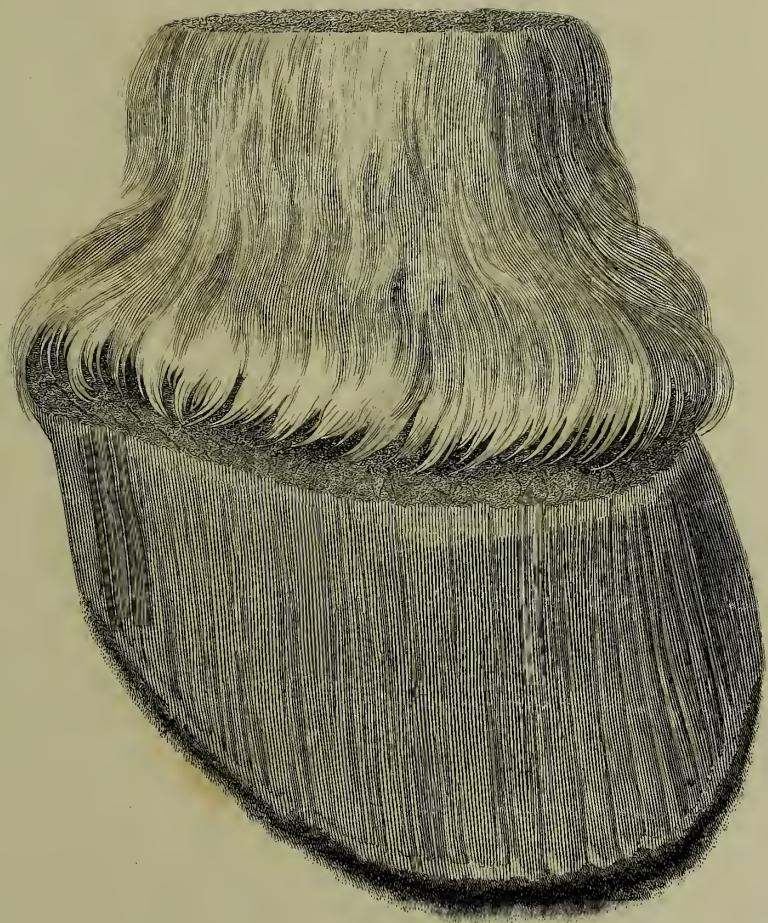


### PLATE XIII.

Front view of the preceding Plate, shewing that the true skin has a fibrous laminated structure, from the coronet to the extremity of the toe ; at which extremity it has a fine villous surface, for the purpose of sensation.

N. B. The returns of this fibrous structure are shewn in the preceding Plate.





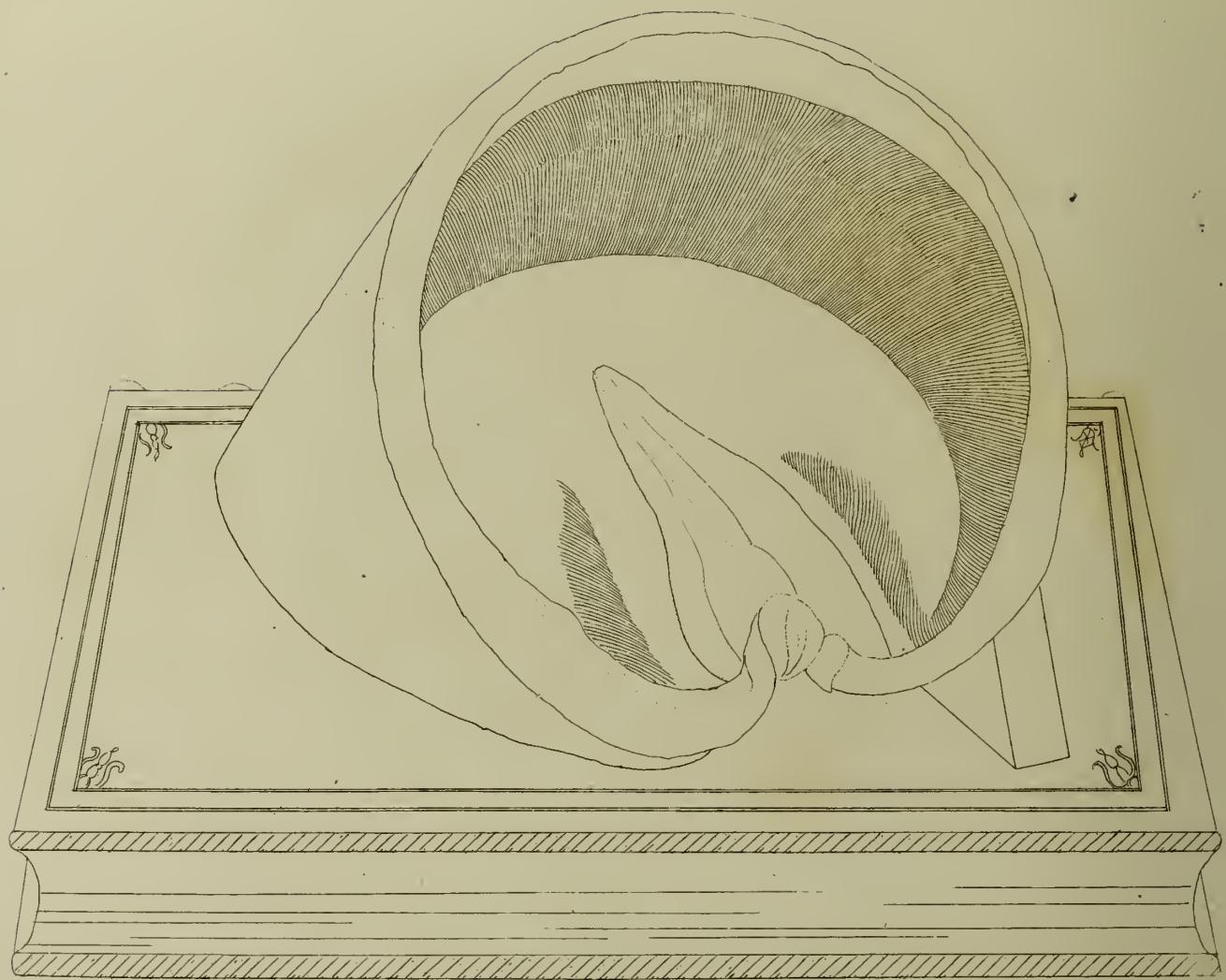
G. Sirtland del.

W. Skelton sculp.

London Published as the Act directs Jan<sup>7</sup> 1<sup>st</sup> 1796, by S Freeman Esq<sup>r</sup>



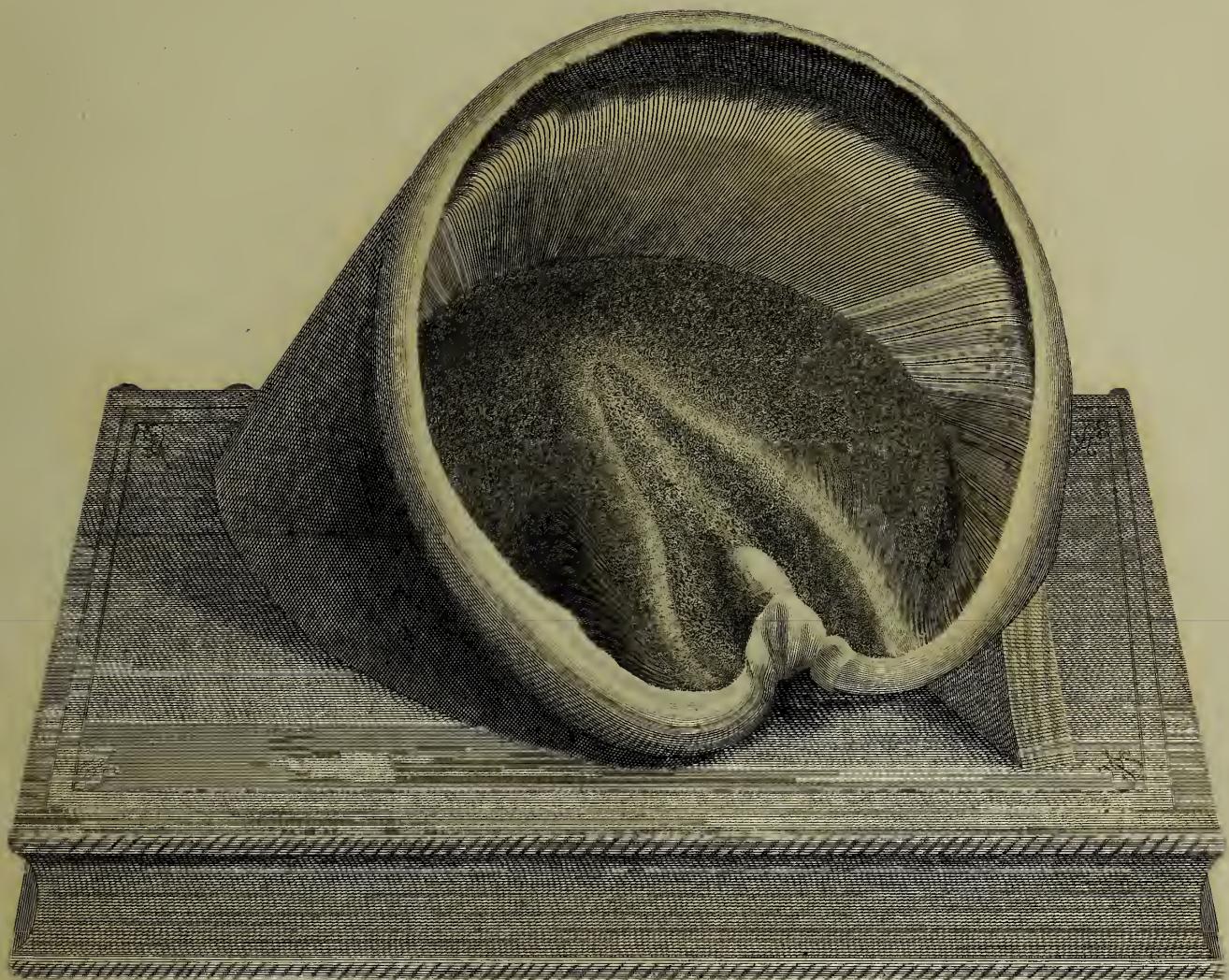




## PLATE XIV.

A view of the internal surface of the hoof, to show the laminated appearance of the walls and bars, adapting it to the fibrous structure seen in the two last Plates.





*J. Kirkland del.*

*W. Skelton sculp.*

London Published as the Act directs Jan<sup>Y</sup> 1<sup>st</sup> 1796. by S. Freeman Esq<sup>r</sup>





FIG. 2



FIG. 1



FIG. 5

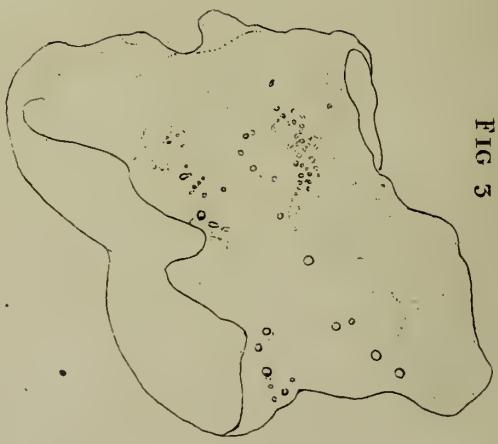


FIG. 4



## PLATE XV.

A comparative view of the bones of the fore and hind foot.

Fig. 1. and 2. Bones of the fore foot explained in Plate II.

Fig. 3. Coronary bone of the hind foot.

Fig. 4. Foot bone and nut bone of the hind foot, shewing that the surface of the foot bone, which is articulated with the coronary bone, is rather more concave than that of the fore foot, and the position of the nut bone more upright ; so that the coronary bone bears more upon the foot bone, and less upon the nut bone. That surface of the nut bone (*a b*), which in the fore foot was smooth, appears rough, and the upper ligaments are attached to the whole of this surface.

*cc* A portion of the cartilage of the foot bone ossified, which is not natural, but so frequently met with, that I thought it necessary to notice it, merely by giving an outline of it.





G. Kirtland del.

W. Skellon sculps.

London Published as the Act directs Jan<sup>Y</sup>. 1<sup>st</sup> 1796. by S. Freeman Esq<sup>r</sup>.





FIG. 1.

Pl. 16.

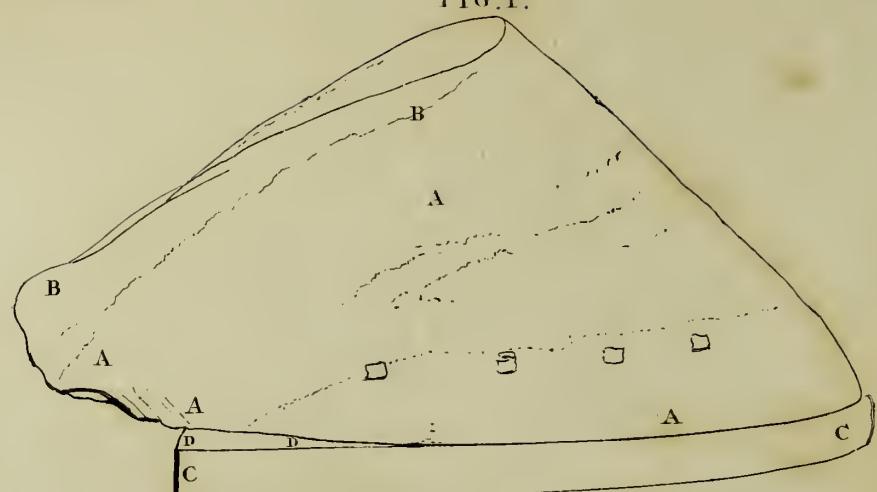


FIG. 5

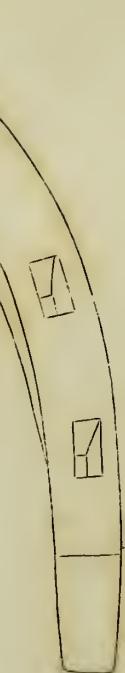
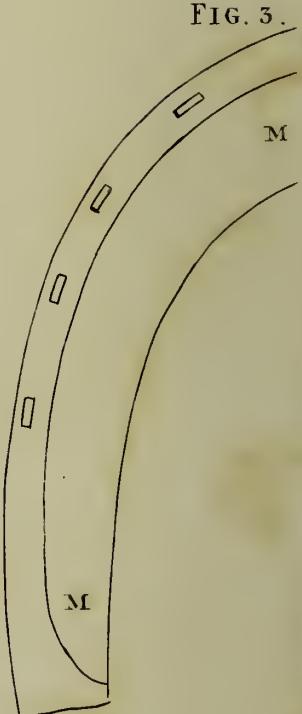
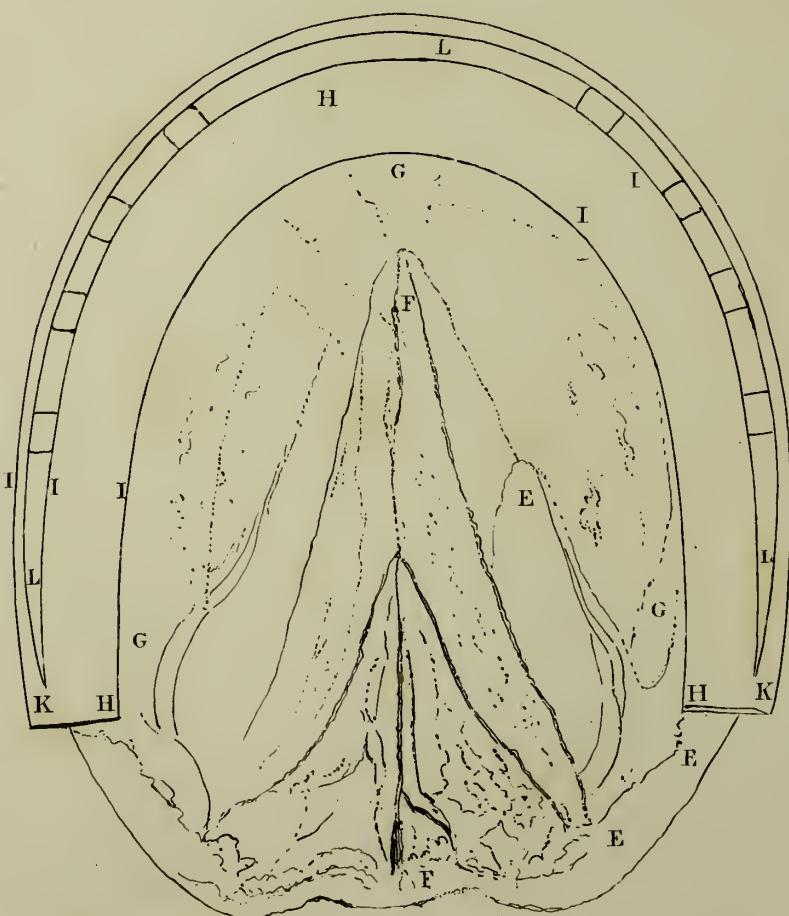


FIG. 4.

FIG. 2.

FIG. 3.



## PLATE XVI.

Two views of the hoof shod, and two different sorts of shoes.

Fig. 1. A lateral view of the hoof, to shew those parts the returns of which constitute the bars and frog; and the position of the lower extremities of the quarters in respect to the shoe.

*a a a a* The quarters, the continuation of which forms the bars.

*b b* The coronet of the hoof, which is continued into the frog.

*c c* The shoe.

*d d* Upper part of the shoe, which projects beyond the quarters, so that the heel of the foot rests on the middle of the heel of the shoe.

Fig. 2. A view of the under surface of the hoof shod, in order to show the sole, the bars, and the frog; and the form and position of the shoe in respect to the foot.

*e e e* The bars of the hoof, constituted by the returns of the quarters, and terminating nearly in a point.

*e f f* The frog, constituted by the returns of the coronet of the hoof.

*g g g* The sole.

*b b b* The shoe.

*i i* The web of the shoe.

*b k* The heel of the shoe, projecting one half of its breadth beyond the heel of the hoof.

*l l l* The fuller of the shoe.

Fig. 3. The surface of the shoe next to the foot, in order to show

*m m* The web, which ought to be hollowed out just sufficiently to admit a picker.

Fig. 4. and 5. The upper and under surfaces of a shoe proper for a manage horse, having a narrow web, and being bevelled off to an edge at the heel.





G. Kirtland del.

W. Steelton sculp.

London Published as the Act directs Jan<sup>Y</sup>. 1. 1796 by S. Freeman Esq<sup>r</sup>

